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THE IRON TRADE REVIEW

Published Weekly
VOL. LXV. No. 23

CLEVELAND, DECEMBER 4, 1919
Entered as second-class matter at the post-office at Cleveland, Ohio, under the act of March 3, 1879

Four Dollars a Year
Single Copies 15 Cents

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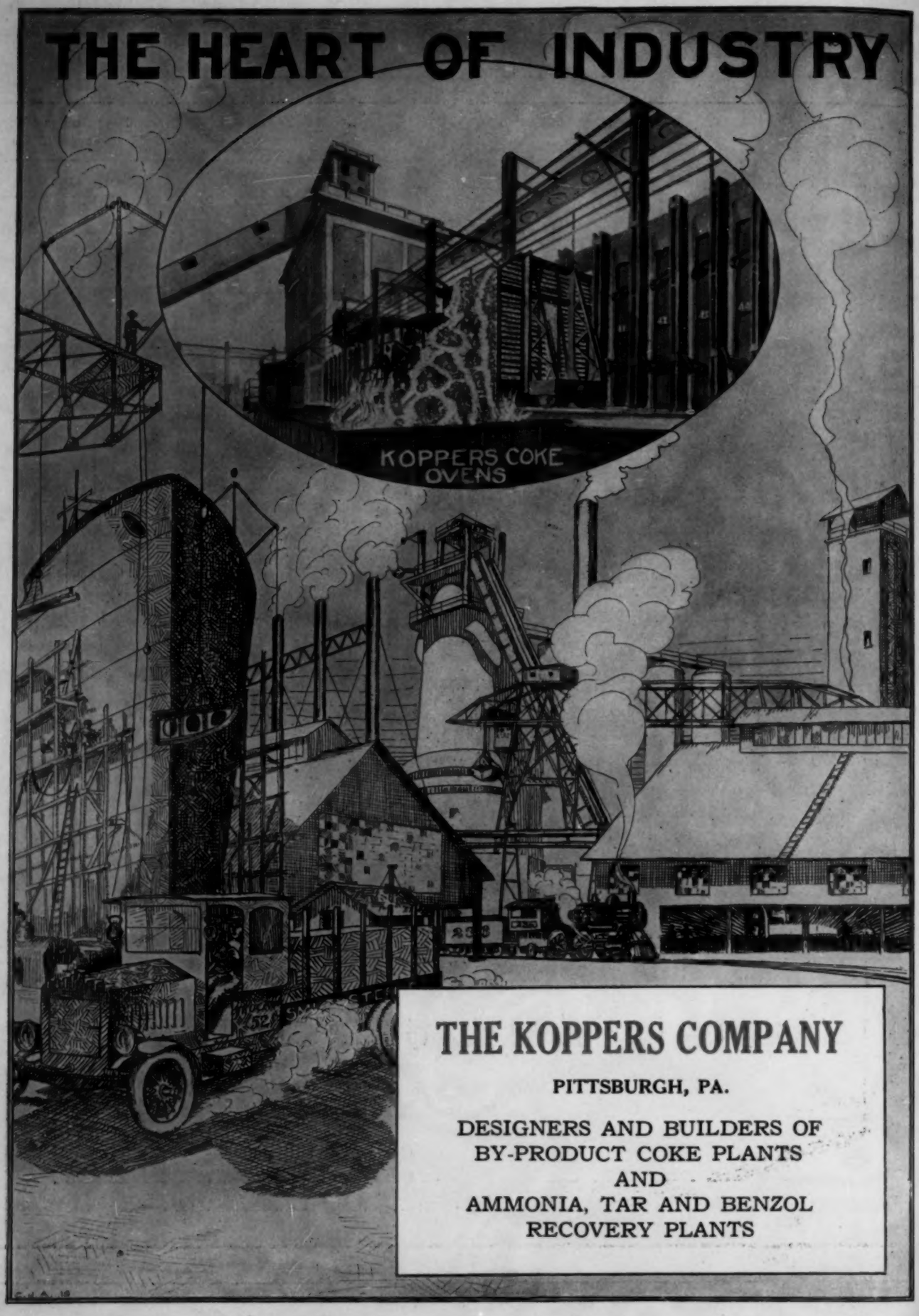
THE HEART OF INDUSTRY
KOPPERS COKE OVENS
THE KOPPERS COMPANY
PITTSBURGH, PA.
DESIGNERS AND BUILDERS OF
BY-PRODUCT COKE PLANTS
AND
AMMONIA, TAR AND BENZOL
RECOVERY PLANTS

THE IRON TRADE REVIEW

Vol. LXV Cleveland, December 4, 1919 *No. 23*

Coal Dominates Steel Market

Substantial Reduction of Mill and Furnace Output Appears Inevitable Under Restrictions Placed on Fuel Supplies—Material Scarcer and Prices Advance Further in Various Lines—November Pig Iron Production Grows

BOTH production and trade in iron and steel are dominated completely by the question of coal supply. Although the direct interference with furnace and mill operations as yet has been slight, the stage where extensive dislocation of plant activities may be expected is approaching rapidly. With more than 50 per cent of the iron and steel industry dependent for coke upon these plants, the action of the central coal committee in cutting supplies of coal to the beehive ovens, 25 per cent will have far-reaching effects. This curtailment represents a shrinkage of 65,000 tons of coke weekly in the Connellsville regions alone and over 100,000 tons weekly in the whole country. Since every ton of coke is needed at present in blast furnace and foundry activities, the enforced reduction of pig iron and castings output may be large. It is of great importance to the general industry, however, that the operations of by-product ovens are not to be interfered with, because of the large number of the steel works, blast furnaces and metallurgical plants which draw upon this source of coke supply.

Under the order, concerning beehive coke, of the fuel administration, the point of greatest effect probably will be the Pittsburgh district, and surrounding territory because of the heavy demands of that section upon the Connellsville operations. The steel department of one Mahoning valley works already is down due to a lack of coal and a large Youngstown steel works will close this week unless relief is forthcoming. The Bethlehem Steel Co. has banked six blast furnaces and is using a higher mixture of anthracite coal in its other stacks.

All Material Is Scarce

The coal stringency following on the heels of the loss of production occasioned by the steel strike, now past, has intensified the already strong position of the market. Selling has been driven into extremely narrow limits both because of the lack of material and the increased uncertainty of manufacturers over future costs. Sellers are able to name their own prices on virtually all products as buyers still are exceedingly anxious to get their wants under cover. The scarcity of wire nails remains acute. The 1920 requirements of this product are estimated at 20,000,000 kegs. The carryover of undelivered 1919 tin plate orders into next year will reach about 8,000,000 base boxes. The demand for line pipe for oil field purposes is tremendous. One order just placed involves 400 miles of 8-inch. If the Standard Oil Co., as reported, connects up its California and northern Texas holdings with a pipe line, this will require approximately 140,000 tons of pipe.

Iron Output Is Larger

November added greatly to the recovery of blast furnace operations from strike effects. Pig iron production in that period was 2,381,327 tons, a gain of 516,903 tons. This represented an average daily increase of 32 per cent. The gain in the number of active furnaces over October was 35, and the total of 251 blowing on the last day of November was only 15 less than in August, a pre-strike period.

Coke prices are following the expected course. Spot fuel is up 50 cents to $1 in the week. Eastern buyers are offering $8, Connellsville ovens, for both spot furnace and foundry coke. One Connellsville maker sold his entire 1920 output at $7, ovens.

Railroad business, actual and prospective, is mounting into big figures. The East estimates 375,000 tons of rails definitely are under negotiation for 1920 and 300,000 tons remain in the same position in the West. The Great Northern is inquiring for 1000 cattle cars and another 3000-car inquiry is up at Chicago.

Iron Advance Continues

As the demand for pig iron far exceeds the restricted tonnage which the makers are willing to offer, prices continue their weekly advance. No. 2 foundry is selling at $38, Buffalo, at $35 to $36 in the valleys, and at $35 in Alabama and Virginia. In the East No. 2X has been sold at $40 and $41. Recent basic sales at Pittsburgh total 40,000 tons or more, the last of which were at $33, valley furnace. Of bessemer sales aggregating 15,000 tons at Pittsburgh, the most recent were at $33.50 to $34, valley.

DECEMBER 4, 1919

THE IRON TRADE REVIEW

A weekly publication devoted to the Iron, Steel, Foundry and Metal-working Industries

Published Every Thursday by

THE PENTON PUBLISHING CO., Cleveland

BRANCH OFFICES

CHICAGO - - - - - - - - 1147 Peoples Gas Bldg.
CINCINNATI - - - - - - - York St. and Western Ave.
NEW YORK - - - - - - 2203-2206 No. 220 Broadway
BOSTON - - - - - - - - - 426 Old South Bldg.
PITTSBURGH - - - - - - - 2148-49 Oliver Bldg.
WASHINGTON, D. C. - - - - - - 40 Metzerott Bldg.
BIRMINGHAM, ENG. - - - - - - - Prince's Chambers
LONDON, ENG. - - - - - - - 16 Regent St., S. W. 1.

Subscription, United States and Mexico, $4 per year. Canada $6, and other Foreign Countries, $8 per year.

Entered at the Postoffice at Cleveland as Second Class Matter

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Member, the Audit Bureau of Circulation and Associated Business Papers, Inc.

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Effect of Mexican Intervention

WITH the strain in the relations between the United States and Mexico again near the breaking point, some consideration is being given in the nonferrous metal markets to the possible economic effects of intervention in the latter country. The extent of government buying of materials for munitions, obviously would depend upon the course and consequences of such intervention, something which cannot be foreseen.

A prompt reflection of military action undoubtedly would be seen in the foreign exchanges, with recovery in the pound sterling, the franc and other exchange values as measured in dollars. A recovery in exchanges would facilitate exports of copper, lead and zinc, and accordingly would strengthen the American markets. The financial situation would be further affected by the elimination of Mexico as a silver producer. Mexico long was the largest silver producing country in the world, but in recent years, due to the chaos there, has been second to the United States. Mexican lead production contributes an important part of the world's lead supplies, especially at present, when bitter strikes are in progress in Spain and Australia. In 1918 the United States imported 78,600 tons of lead from Mexico and thus far this year, 45,000 tons. This lead, which would carry a duty of 25 per cent if imported, is smelted and refined in bond and applied on export orders. Withdrawal of Mexican lead from the world's markets would result in foreign buying competition for domestic lead, with consequent higher prices. Mexico also is an important producer of copper, but world stocks of this metal are sufficient to meet immediate needs.

However, there are other, more abstruse but probably more important by-products of intervention which may enter into metal market calculations. Armed conflict might serve to awaken the public to a clearer view of realities and responsibilities. It might restore a true perspective to that part of labor which lately has been misled by a few pigmy-souled leaders. In other words, it might stimulate the country to get back to work, which is the only remedy we need for our present economic ailments. With the memory of the world war fresh in our minds, no sane citizen craves trouble with Mexico, but intervention might not be an unmixed evil.

Plotting Crane Business of 1919

IF THE shipments and orders figuring in this year's business in overhead cranes were roughly charted, the resulting graph would reveal conditions of unusual interest. The line representing shipments would start at its highest point in January, while that corresponding to bookings would begin in that month at its lowest mark. The line indicating orders probably would run along at this minimum for about five months and then shoot abruptly upward until in July it would reach its highest point. Following this line further, a slight drop in August would be noticeable but the level reached in that month would be maintained during the following two months, after which another slight drop would be indicated. It is problematical just where the line would end at the close of the year but it is quite certain that the volume of orders for December will be well above the low point of January.

Following the line of shipments from its high mark of January, no change would be perceptible during the period of the first four months, after which a sharp depression would indicate the decided slump which took place in May. Since shipments continued in this volume until August, the line would run parallel to the eighth month where it would rise slightly and then gradually descend to the year end.

Briefly summarizing, this chart would reflect large bookings at the beginning of the year which were to be completed; light bookings during the first five months with a heavy gain in the last half of the year; and light shipments as the shops made headway with their new business. Slight interruptions in the volume of shipments undoubtedly were caused

by labor trouble. However, it is safe to assert that even though orders in December fall still further, new business in the last half of the year will treble that of the preceding period.

Taking Dividends Through Esteem

IDEALS in business surely are working toward a higher level than ever before. Simply getting the money no longer is the only aim of the seller. To gain and hold the respect and esteem of the consumer is deemed no less desirable or necessary to a perfect business transaction as a profit. The time was when a monopoly was regarded simply as an opportunity and the buyer was made to pay whatever the traffic would stand. Now a monopoly is not only an opportunity but a responsibility. Both sides of the shield are con-

If conditions offer the opportunity to exact from the buyer the responsibility of the situation becomes an influential factor in determining what the seller may ask and prevents oppression. There comes to mind the attitude of a certain large producer of a raw material in the iron and steel industry which has come in recent years to a virtual domination of a large consuming field. Yet notwithstanding the opportunity to profit largely from this favorable situation prices have been held lower than would have been the case had there been competition in that field.

This interest has taken the lead in restraining rising quotations and has sold much below the level at competing products from other fields, when at least the same price could have been obtained In this case the responsibility has weighed heavier in the scale than the opportunity. This is a far-sighted policy which should build a deep foundation for the future and gain an esteem and trust from the consumer that will be a valuable asset to the producer in the years to come.

Is Open Hearth Gaining Favor?

UP TO the present time the most reliable and satisfactory information regarding the post-war status of the iron and steel industry in Lorraine, the Saar valley and the occupied districts of Germany have come from the report made by the commission appointed by the British minister of munitions. In an article appearing in this issue of THE IRON TRADE REVIEW, which is the third of a series based upon the report, the interesting statement is made that nearly all of the steel for high explosive shells was made by the open-hearth process. Furthermore, it is stated that only one company was able to satisfactorily produce high explosive shell steel in basic bessemer converters without heavy rejections.

In view of the fact that by far the greatest part of the steel made in the districts visited is produced by the bessemer process, the enforced employment of open-hearth furnaces is significant. European steelmakers have defended the converter because of the high cost of producer gas and the absence of scrap. They also point to the fact that 30 blows per 12-hour shift are averaged by converters in the Lorraine district, whereas the normal number of heats from an open-hearth furnace is three or four per 24 hours. Yet in spite of these apparently good reasons for preferring the bessemer process, the report of the commission contains numerous instances of building and contemplated additions to plants in which open-hearth furnaces are specified. In one German plant all of the steel is made in open-hearth units and in several new plants under construction on the west bank of the Rhine extensive open-hearth equipment is being installed.

It probably is premature to state that the turning point in the production of steel in Europe is in sight, yet there is strong evidence of a tendency on the part of steelmakers to look more favorably upon the open-hearth process. The output of open-hearth metal first surpassed that of bessemer steel in the United States in 1907 and 1908, and since that time the converter process steadily has lost favor. Possibly the experience with the open-hearth process gained by European steelmakers during the war may have a noticeable influence on the choice of melting equipment for the new steel plants which will rise as part of the reconstruction program of European countries.

Henry Clay Frick, Master of Steel

HENRY CLAY FRICK and his great talent which gained for him a mastery in big business represented an influential personality in the American iron and steel industry up to the day of his death. Unlike Andrew Carnegie, when he disposed of his interests in the Carnegie Steel Co. to the United States Steel Corp., he did not retire from the business world but placed his ability and knowledge in the iron and steel industry at the disposal of the giant and untested enterprise. All these years he has been one of the vital forces in the shaping and advancement of the Steel corporation to its present position of maturity and power. His work done and counsel given quietly in the high and inner administrative circles of that organization were no less effective and invaluable both to his direct interests and to the whole American iron and steel industry.

Henry Clay Frick, a power in the formative days of American steelmaking as a national industry, by his eminent qualities commanded for himself the signal privilege of becoming an outstanding figure in the era of great development that followed and which he no doubt foresaw.

Iron and Steel Prices

Corrected to Wednesday Noon

SCRAP, WAREHOUSE, ORE AND OTHER PRICES ON PAGES 1552 AND 1554

Pig Iron

Bessemer, valley	$34.00
Bessemer, Pittsburgh	35.40
Basic, valley	33.00
Basic, Pittsburgh	34.40
Basic, delivered, eastern Pa.	33.00
Malleable, Pittsburgh	35.00 to 36.65
Malleable, Chicago, furnace	35.50
Malleable, Buffalo, furnace	39.25
Malleable, delivered eastern Pa.	36.00 to 38.00

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.25
No. 2 Southern foundry	1.75 to 2.25
No. 2X Eastern and Virginia	2.25 to 2.75
No. 1X Eastern	2.75 and up
No. 1 Chicago	2.25 to 2.75
No. 2 foundry Eastern	1.75 to 2.25

No. 1X, eastern delivered Phila.	$40.10 to 42.10
No. 1X, Buffalo	41.00
No. 1 foundry, Chicago, furnace	36.25
No. 2 foundry, valley, Pittsburgh	35.40
No. 2 foundry, Buffalo	38.00
No. 2 foundry, Boston	35.00 to 36.00
No. 2 foundry, Chicago furnace	35.00
No. 2 foundry, Ironton furnace	35.75 to 36.75
No. 2 foundry, Cleveland furnace	35.00 to 36.00
No. 2X, eastern del., Phila.	37.10 to 39.10
No. 2X, eastern, N. J., tidewater	37.10 to 39.10
No. 2X, eastern, Boston	39.90 to 40.90
No. 2X, foundry, Buffola furnace	39.25
No. 2 foundry, del., Philadelphia	35.10 to 37.10
No. 2 foundry, N. J. tidewater	35.10 to 37.10
No. 2 southern, Birmingham	34.00 to 35.00
No. 2 southern, Cincinnati	37.60 to 38.60
No. 2 southern, Chicago	37.00 to 38.00
No. 2 southern, Phila.	38.50 to 39.50
No. 2 Southern, Cleveland	37.00 to 38.00
No. 2 southern, Boston	41.00 to 42.00
No. 2 southern, St. Louis	38.25
Virginia, No. 2X, furnace	36.25
Virginia, No. 2X, Philadelphia	40.35
Virginia, No. 2X, Jersey City	40.65
Virginia, No. 2X, Boston	40.95
Gray forge, valley, Pittsburgh	34.40
Gray forge, Buffalo	32.00 to 33.00
Gray forge, eastern Pa.	34.50
Silveries, 8% furnace	47.25 to 48.25
Ohio Silveries, 8%, Chicago	46.80
Tennessee Silveries, 8%, Chicago	48.65
Low phos. standard, Phila.	43.50 to44.00
Low phos. Lebanon, furnace	37.00
Low phos. standard, Pittsburgh	41.40
Charcoal, Superior, Chicago	35.50 to 38.00
Charcoal, Superior, Chicago first quarter 1920	35.50 to 37.50

Coke

(At the ovens)

Connellsville furnace	6.50 to 7.00
Connellsville foundry	7.00 to 7.50
Pocahontas furnace, nominal	5.75 to 6.00
Pocahontas foundry, nominal	6.50 to 7.00
New River foundry, nominal	11.50 to 12.00
New River furnace, nominal	9.50 to 10.00
Wise county furnace, nominal	8.00 to 9.00
Wise county foundry, nominal	10.00 to 11.50

Ferroalloys

Ferromanganese, 80 per cent, delivered, domestic metal	$120.00
Ferromanganese, 80 per cent, English c.i.f. Atlantic ports	110.00
Spiegel, 18 to 22 per cent furnace spot	37.00 to 38.00
Ferrosilicon, 50 per cent, spot and contract, delivered	80.00 to 85.00
Ferrotungsten, standard, per pound contained, furnace	1.10 to 1.20
Ferrochrome, 60 to 70 per cent chromium, 6 to 8 per cent carbon, per pound contained, maker's plant	27c to 29c
Ferrovanadium, 35 to 40 per cent per pound contained, according to analysis	$5.50 to $7.00
Ferro carbon-titanium, carloads, producers plant, per net ton	200.00
Bessemer, ferrosilicon, 10 pe cent	54.75 to 56.75
Bessemer, ferrosilicon, 11 per cent	58.05 to 60.05
Bessemer, ferrosilicon, 12 per cent	61.35 to 63.35

Prices at Jackson and New Straitsville, O.

Semifinished Material

BILLETS AND BLOOMS

(4 x 4 inch)

Open-hearth, Pittsburgh	42.00 to 44.00
Open-hearth, Philadelphia	52.00 to 54.00
Open-hearth, Youngstown	42.00 to 44.00
Bessemer, Pittsburgh	42.00 to 44.00
Bessemer, Youngstown	42.00 to 44.00
Forging, Pittsburgh	51.00 to 53.00
Forging, Philadelphia	60.00 to 64.00

SHEET BARS

Open-hearth, Pittsburgh	$45.00
Open-hearth, Youngstown	45.00
Bessemer, Pittsburgh	45.00
Bessemer, Youngstown	45.00

SLABS

Pittsburgh and Youngstown	43.00

WIRE RODS AND SKELP

Wire rods, Pittsburgh	$60.00 to 63.00
Grooved skelp, Pittsburgh	2.45c
Sheared skelp, Pittsburgh	2.65c

Shapes, Plates and Bars

(In cents per pound)

Structural shapes, Pittsburgh	2.45c
Structural shapes, Philadelphia	2.695c to 2.925c
Structural shapes, New York	2.72c to 3.00c
Structural shapes, Chicago	2.72c
Tank plates, Pittsburgh	2.50c to 2.65c
Tank plates, Chicago	2.92c
Tank plates, Philadelphia	2.895c to 3.045c
Tank plates, New York	2.92c to 3.07c
Bars, soft steel, Pittsburgh	2.35c to 2.50c
Bars, soft steel, Chicago	2.62c
Bars, soft steel, New York	2.62c to 2.87c
Bars, soft steel, Philadelphia	2.595c to 2.845c
Bar iron, common, Phila.	2.995c to 3.245c
Bar iron, common, Chicago	2.77c to 3.00c
Bar iron, common, Cleveland	3.25c
Bar iron, common, New York	3.02c to 3.27c
Bar iron, common, Pittsburgh	3.25c
Hard steel bars, Chcago	2.85c

Rails, Track Material

Standard bessemer rails, mill	$45.00
Standard open-hearth rails, mill	47.00
Relaying rails, light, St. Louis	40.00 to 46.00
Relaying rails, Pittsburgh	40.00 to 43.00
Angle bars, Pittsburgh base	2.75c
Angle bars, Chicago base	2.75c
Light rails, 25 to 45, mill	$2.10 to 2.45
Spikes, railroad, Pittsburgh	3.35c
Track bolts, Pittsburgh	5.00c
Track bolts, Chicago	4.62c
Track spikes, Chicago	3.62c
Tie plates, Chicago	2.75c to 2.90c

Wire Products

(100 lbs. to jobbers, carloads; retailers, 5c more)

Wire nails, Pittsburgh	3.50c
Plain wire, Pittsburgh	3.10c to 3.25c
Galvanized wire, Pittsburgh	3.80c to 3.95c
Barbed wire, painted, Pitts.	3.50c
Barbed wire, galvanized, Pitts.	4.20c
Cut nails, Pittsburgh l. c. l.	5.195c
Coated nails per count keg, Pitts.	3.10c to 3.25c
Polished staples, Pittsburgh	3.50c
Galvanized staples, Pittsburgh	4.20c

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Chain, Piling, Strip Steel

(In cents per pound)

Chain, 1 in. proof coil, Pitts.	5.75c
Sheet piling, base, Pittsburgh	2.55c

Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100 inch and heavier, base per 100 pounds, 6.00c.

Sheets

(In cents per pound)

SHEET MILL BLACK

No. 28, open-hearth, Pitts.	4.35c
No. 28, bessemer, Pitts.	4.35c
No. 28, open-hearth, Chi.	4.62c

TIN MILL BLACK

No. 28, open-hearth, Pitts.	4.35c
No. 28, bessemer, Pitts.	4.35c

GALVANIZED

No. 28, open-hearth, Pitts.	5.70c
No. 28, bessemer, Pitts.	5.70c
No. 28, open-hearth, Chi.	5.97c

BLUE ANNEALED

No. 10, open-hearth, Pitts.	3.55c
No. 10, bessemer, Pitts.	3.55c
No. 10, open-hearth, Chi.	3.82c
No. 10, open-hearth, Phila.	3.994 to 4.095c

Full sheet schedule page 1552.

Tin Plate

(Per 100 lb. box)

Tin plate, coke base, Pitts.	$7.00

Iron and Steel Pipe

Base Pittsburgh to Jobbers Carloads

Base, Pittsburgh	Black Per cent off	Galv. Per cent off
¾ to 3 in., butt, steel	57½	44
⅜ to 3 in., butt, iron	34½	18½

Full pipe schedule page 1552.

Boiler Tubes

Steel, 3½ to 4½ inches, l. c. l.	40⅛
Iron, 3½ to 4½ inches, c. l.	16

Cast Iron Water Pipe

Without War Freight Tax

(Class B Pipe)

Class A pipe is $2 higher than Class B.

Four-inch, Chicago	$65.80
Six-inch and over, Chicago	62.80
Four-inch, New York	61.30
Six-inch and over, New York	58.30
Four-inch, Birmingham	58.00
Six-inch and over, Birmingham	55.00

Hoops, Bands, Shafting

Hoops, Pittsburgh	3.05c
Bands, Pittsburgh	3.05c
Hot rolled strip steel, Pitts. stamping quality	3.50c
Cold finished steel bars, Pitts., base	3.60c

Rivets

Structural rivets, Pittsburgh	3.90c to 4.15c
Boiler rivets, Pittsburgh	4.00c to 4.25c
Rivets ⅞ in. and smaller Pitts.	.50 to 50—10 off

Nuts and Bolts

(Prices f. o. b. Pittsburgh)

CARRIAGE BOLTS

(⅜ x 6 inches, smaller and shorter)

Rolled thread	45-5 to 50-10 off
Cut thread	40-5 to 50-10 off
Larger and longer	30-10 to 40-10 off

MACHINE BOLTS

(⅜ x 4 inches, hot pressed nuts)

Rolled thread	50-7½ to 60 off
Cut thread	40-10-5 to 50-10 off
Larger and longer	40 to 40-10 off
Cold pressed semifinished hexagon nuts ⅝ in. and larger	60-10-5 off
Cold pressed semifinished hexagon nuts ⅞ in. and smaller	70-10-5 off
Gimlet and cone point lag screws	50-10 off

NUTS

Hot pressed, square blank	2.50c to 2.70c off
Hot pressed, square tapped	2.25c to 2.45c off
Hot pressed, hexagon blank	2.50c to 2.70c off
Hot pressed, hexagon tapped	2.25 to 2.45c off
Cold pressed, square tapped	2.25c to 2.45c off
Cold pressed, square blank	2.50c to 2.70 off
Cold pressed, hexagon blank	2.50c to 2.70c off
Cold pressed, hexagon tapped	2.25c to 2.45c off

Prices Present and Past

(Yesterday, a month ago, three months ago and a year ago)

Prices are those ruling on the largest percentage of sales at the dates named.

	Prices Dec. 3, 1919	Average prices Nov. 1919	Sept. 1919	Dec. 1918
Bessemer valley, del., Pittsburgh	$35.40	$32.00	$29.35	$36.60
Basic, valley, delivered, Pittsburgh	34.40	30.40	27.15	34.40
*No. 2 Foundry, Pittsburgh	36.40	33.15	28.15	35.40
*No. 2 Foundry, Chicago, furnace	35.00	31.75	26.75	34.00
Lake Superior charcoal, Chicago	35.50	35.50	32.75	38.70
Malleable, valley	35.50	31.75	28.65	35.90
Malleable, Chicago	35.50	32.25	27.25	34.50
*Southern, No. 2, Birmingham	35.00	30.65	26.75	35.25
*Southern Ohio, No. 2, Ironton	36.00	31.75	26.75	34.00
Basic, eastern del., eastern Pa.	33.00	33.00	27.00	36.90
**No. 2X, Virginia, furnace	36.25	33.40	29.25	38.00
*No. 2X, eastern del., Philadelphia	38.10	35.85	29.95	39.15
Gray forge, valley del., Pittsburgh	35.40	31.80	27.15	34.40
Ferromanganese, 80 per cent, delivered	120.00	110.00	105.00	240.00†
Bessemer billets, Pittsburgh	42.00	40.90	38.50	47.50
Bessemer sheet bars, Pittsburgh	45.00	45.00	42.00	51.00
Open-hearth sheet bars, Pittsburgh	45.00	45.00	42.00	51.00
Open-hearth billets, Pittsburgh	42.00	40.90	38.50	47.50
Steel bars, Pittsburgh	2.50c	2.45	2.35	2.90
Steel bars, Chicago	2.62	2.62	2.62	3.17
Iron bars, Philadelphia	2.995	2.895	2.595	3.745

	Prices Dec. 3, 1919	Average prices Nov. 1919	Sept. 1919	Dec. 1918
Iron bars, Cleveland	$3.25	$3.00	$2.52	$3.64
Iron bars, Chicago mill	2.77c	2.73	2.62	3.50
Beams, Chicago	2.72	2.72	2.72	3.27
Beams, Pittsburgh	2.60	2.60	2.45	3.00
Beams, Philadelphia	2.695	2.695	2.695	3.245
Tank plates, Pittsburgh	2.65c	2.65	2.60	3.25
Tank plates, Chicago	2.93	2.92	2.92	3.52
Tank plates, Philadelphia	2.895	2.895	2.845	3.395
Sheets, blk., No. 28, Pittsburgh	4.35	4.35	4.35	5.00
Sheets, blue anld., No. 10, Pittsburgh	3.55	3.55	3.55	4.25
Sheets, galv., No. 28, Pittsburgh	5.70	5.70	5.70	6.25
Wire nails, Pittsburgh	3.50	3.45	3.25	3.50
Connellsville furnace coke	6.50	5.80	4 60	6.00
Connellsville foundry coke	7.50	6.95	5.50	7.00
Heavy melting steel, Pittsburgh	24.50	21.90	20.50	27.50
Heavy melting steel, eastern Pa.	22.50	20.80	19.00	24.75
Heavy melting steel, Chicago	21.00	20.65	19.00	26.50
No. 1 wrought, eastern Pennsylvania	30.00	27.85	27.00	33.50
No. 1 wrought, Chicago	27.00	26.50	21.25	29.65
Rerolling rails, Chicago	31.50	31.15	25.40	30.40

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon. †70 per cent.

No Halt In Rising Iron Prices

Threat of Curtailment of Furnace Output by Coal Situation Intensifies Already Strong Market—Pittsburgh Basic Sales Total 40,000 Tons and Price Reaches $33 —Northern No. 2 at $35 to $38—Southern at $35

Pittsburgh, Dec. 2.—Recent trading in the pig iron market here was featured by some big sales of basic. One merchant interest in November made sales aggregating more than 36,000 tons of this grade, of which 26,000 tons were sold during the last few days of the month at $32, valley furnace. This company also made sales of approximately 15,000 tons of bessemer last month, the most recent of which were from $33.50 to $34, valley furnace. Another merchant producer in the past few days has sold several thousand tons of basic to a Canton, O., steel manufacturer, at $53, valley furnace. Although recent transfers of basic grades are well up to 40,000 tons, shipments of which begin immediately, and run over the first quarter of 1920, only a part of the known inquiries have been covered. The Carbon Steel Co. is believed to have bought a portion of the 15,000 tons for which it recently inquired and it is not believed that either the Trumbull Steel Co. or the United Alloy Steel Corp., which also put out inquiries for substantial tonnages, have been covered in full. As far as can be learned the N. & G. Taylor Co. has not yet closed for the 3600 tons it asked for first quarter. The basic market now appears well established at $33, valley, and bessemer at $34, valley. A small tonnage of the latter recently was sold at $37, valley furnace for prompt shipment and an inquiry is out from a Pittsburgh district consumer for 500 tons for early 1920 delivery. Average prices in November for bessemer and basic iron in lots of 1000 tons or more as compiled by W. P. Snyder & Co., Pittsburgh, show a price of $30, valley, on bessemer and $30.16 on basic. This is the first change in the averages since last March. As to sales, the market has been somewhat quieter on foundry iron than it was recently, but this condition reflects the fact that makers are heavily committed against first half production and are unwilling to take on further tonnages. Several small lot tonnages of No. 2 foundry for prompt delivery recently have been sold from $35 to $36, furnace, and a sale of 800 tons for first half is noted to a Pittsburgh district structural company at $36, furnace. Two inquiries from 2500 to 300 tons of foundry iron for first half are before makers. The interest which sold the 800 tons of No. 2 grade at $36 for first half delivery has withdrawn from the market. Another merchant producer with furnaces in the valley and along the lake fronts also has withdrawn. Both of these makers have little or no tonnages unpledged for first half. A steady decline in merchant production over the last seven months, coupled with the loss of output occasioned by the strike, has produced a serious shortage of all grades of iron. The Cherry Valley furnace recently went into blast after being down for a little over two months for relining and rebuilding. This furnace has been considerably enlarged and now has a rated capacity around 400 tons per day. The Carnegie Steel Co. has 47 of its 59 stacks in blast, or only one less than just before the strike.

Upward Move Gains Momentum

New York, Dec. 1.—Now that pig iron prices are advancing so swiftly and the supply of iron is so thoroughly sold up, the question has arisen whether this is merely one of the periodical boom markets, or whether conditions for sometime to come will be dictated by the insufficiency of producing capacity. Where steel capacity has undergone a big expansion since 1914, it is pointed out that there has been no such expansion in pig iron capacity. Furthermore while the number of foundries throughout this district has not greatly increased in the past two or three years foundries generally have greatly increased their melting capacity. Hence, it is believed, the normal consumption of iron now is at a much greater rate than in prewar times. Eastern blast furnaces are well sold up. Makers in the Buffalo district and in central Pennsylvania, whose furnaces have been idle by reason of the strike or by lack of assurance as to fuel supply, will carry over into next year large undelivered tonnages on old contracts. Some of the furnaces which have been operating have disposed of the major portion of their first half output. A few makers either have taken only a little tonnage for first half or none at all. It is safe to say, however, that at least one-half of the total tonnage to be made by eastern furnaces during the first half of 1920, already has been sold. In view of this situation, demand during the past couple of weeks has involved a good deal more tonnage than the furnaces have been willing to book. It is this situation which is resulting in steadily rising prices. Eastern Pennsylvania foundry iron has been sold during the past week for first half delivery at $37 and $38 furnace, for 2.25 to 2.75 silicon, and at $39 to $41 furnace, for 2.75 to 3.25 silicon. The asking price on eastern Pennsylvania foundry in some cases now is

$40 furnace for 2.25 to 2.75 silicon. Central Pennsylvania iron has sold in round tonnages for first half at $37.50 furnace, for 2.25 to 2.75 silicon, and with some makers the minimum now is $39 furnace. The Virginia Iron, Coal & Coke Co., after being in the market for first quarter during the past week, withdrew today after booking what is said to have been a large tonnage in the aggregate. Other Virginia makers who still have some tonnage to sell for this year have advanced to the level that the Virginia company was asking on first quarter. The minimum on Virginia iron for any delivery now seems to be $35 furnace for 1.75 to 2.25 silicon and $38 furnace on 2.75 to 3.25 silicon. No Virginia 2.25 to 2.75 silicon is being offered now as far as known. Southern prices are advancing, and after sales at $35 Birmingham for 1.75 to 2.25 silicon one southern maker, in connection with some tonnage in this district, now is quoting $36.70, Birmingham, on 1.75 to 2.25 silicon, and $37.80 Birmingham, on 2.25 to 2.75 silicon. One lot of 1500 tons was sold by a Birmingham district maker recently for shipment into this territory this year.

Buffalo Prices Again Up

Buffalo, Dec. 2.—Still further increases in pig iron quotations marked the opening of the week in the Buffalo district. The market is flooded with an exceptionally large volume of good inquiry. All three grades of foundry have advanced in price due to the heavy demand as has basic and malleable also. There is no malleable being made, but there is a strong and insistent demand for it. The base price on No. 2 foundry (1.75 to 2.25 silicon) now is $38. The price on No. 2X (2.25 to 2.75 silicon) is $39.25 and for No. 1X (2.75 to 3.25 silicon) $41. Basic has gone to $36 and offers of $39.25 for malleable have found no takers. The prices quoted were definitely established this week by one producing interest with considerable first half capacity unsold, but were not announced by the other producing interest until early this week. Then the latter's old prices of $36, $37.25 and $39 were withdrawn in favor of the advanced figures, so heavy was the business on this level. Foundries which have seldom come into this district for iron, are inquiring and are willing to absorb the freight differential against them. December iron is practically a negligible quantity, except for very small lots from one furnace. Inquiry during the past week has totaled nearly 50,000 tons with many 1000-ton and some 5000-ton lots. One Susquehanna furnace is in operation of a battery of three. The others are being relined. This interest, due to the strike, has lost 80,000 to 85,000 tons of production, and it is doubtful when it will be in the market again. A producer sold 100 tons of No. 1X at $41 Monday and quoted $40 on 1000 tons of No. 2 foundry subject to immediate acceptance.

Prices Increase Rapidly

Cleveland, Dec. 2.—Extreme strength characterizes the pig iron market and as the demand far exceeds the available supply or the willingness of makers to sell, prices have continued to show rapid rise. Cleveland high silicon foundry iron was sold in the week at $36 for the base grade and the ideas of local makers now are not less than $35 to $36 for No. 2 (1.75 to 2.25 silicon). These prices largely are nominal, however, as Cleveland makers are not selling at present. Ironton makers have quoted $38 base furnace this week but have made no sales as yet at this figure.. Inquiries are coming from districts which have never before drawn iron from this territory. Basic iron is higher, a lot of 3000 tons for December having been sold this week at $33, valley furnace. This followed a sale of 5000 tons for the next several months' delivery at $32, valley furnace. The United Alloy Steel Corp., Canton, O., has been a buyer of considerable tonnage of basic and still is in the market. The Trumbull Steel Co., Warren, O., still is figuring on 10,000 to 15,000 tons. The coal strike rapidly is reaching the stage where it promises to affect the operations of both blast furnaces and iron consumers. Nothing of this kind yet has happened in this territory but coal supplies are becoming dangerously slow. Local blast furnace operations are unchanged.

Few Producers Will Sell

Chicago, Dec. 2.—Where to place contracts for pig iron is a difficult problem and of far more importance to holders than cost. As far as can be learned all southern producers are now out of the market with final sales before their retirement usually at $35, Birmingham. Northern producers have not been able to offer any iron for several weeks and see no prospect of taking further business until after the first of the year. The present quotation of $35, furnace, 1.75 to 2.25 silicon is purely nominal, as no sales are being made at that or any other figure. The only source of iron at present seems to be from producing centers east of Chicago. The Virginia Coal, Iron & Coke Co. has retired from the market after selling 2.25 to 2.75 silicon at $36.75, furnace, subject to freight rates of $4.10 and $4.90. This figures back to $35, base, for silicon 1.75 to 2.25, but none of that grade was available. One seller in the Chicago district is offering a small tonnage from a Virginia furnace at $36, furnace, subject to $5 freight rate, and full manganese differentials, which would mean $1.50 additional for 2 per cent manganese. An offer recently was made to a consumer of 1000 tons of foundry at $39, Buffalo furnace, with $5.30 freight. A sale of 1000 tons of malleable was made recently at $36, valley furnace, with freight of $3.80 for delivery any time before March 31. An inquiry is current for 4000 tons of malleable for second quarter and another for 1500 tons of malleable with silicon 2.25 or over. A southern Wisconsin tractor manufacturer is seeking for 1000 tons of foundry and another southern Wisconsin foundry wants 500 tons of foundry. In addition to the inquiry which is active, a much larger total would come out if melters saw any possibility of placing their orders. Producers of Lake Superior charcoal iron are receiving much inquiry but local representatives find it difficult to obtain a quotation as most of this business is being handled direct. One producer of silvery in Jackson county is taking business on the basis of $50, furnace, for 8 per cent, with $3.80 freight to Chicago. A Tennessee stack offers some tonnage for December at $50.25, furnace, for 8 per cent, with $3.40 freight to Chicago.

Southern Iron Again Advances

Cincinnati, Dec. 2.—Southern foundry iron has registered a sharp advance for first quarter delivery. The average quotation made by furnaces now willing to take on first quarter business, is now around $35, Birmingham, for 1.75 to 2.25 silicon. Practically no foundry iron of this analysis can be had in the South for prompt shipment, although some off-grade iron can be had. Southern Ohio has practically been cleaned out and no open offers are made for any shipment. However, some first quarter iron was disposed of during the past few days above $36, Ironton, for first quarter. It is currently reported that the production of malleable is being cut off on account of the coal shortage. Malleable is very strong and only a limited quantity can be had in southern Ohio. Definite quotations on malleable can not be obtained, but it is understood producers are watching foundry iron closely and such business as is taken is booked at the usual 50 cents advance over the base foundry price. The melting of iron by all foundries in this territory is very heavy. The stove foundries are probably consuming more metal than at any time heretofore. Consumers who are well provided for the future, are trying to get under cover, as the general impression seems to be that prices will go higher before Jan. 1.

Southern Production Off

Birmingham, Ala., Dec. 2.—Pig iron production is lower in the South. This is bound to bring about more caution among producers selling into next year. Quotations are attractive to the furnaces but apprehension is felt as to ability to deliver and to the cost of production. An advance in the wages of coal mine workers will bring about an increased cost in pig iron. The market is strong at $33 to $34 for No. 2 foundry (1.75 to 2.25 silicon) and there are indications that a further advance is likely. One furnace reports some sales as high as $35. Two furnaces are under repairs while the fires in three stacks have been banked for several weeks. Railroad car supply has not been up to expectations and as a consequence the reduction of accumulated stocks has not been as rapid as desired. Inquiries continue numerous and from all directions.

One maker of foundry iron in this district has advanced his price to $35 for No. 2 and is selling only to the second quarter. Considerable tonnage was closed formerly at $34. The advance of $1 per ton was made to take care of future conditions which

it is believed may include an advance in freight rates.

No Spot Iron Available

St. Louis, Dec. 2.—The demand for pig iron continues well in excess of available supplies. All classes of consumers are endeavoring to cover their requirements, both immediate and future. Inquiries are being turned down in wholesale especially those for early shipment. Apparently there is no more spot iron to be had. Spot sales during the week were confined to small lots of offgrades, or a few cars held by brokers, which brought premiums. The larger interests, it develops, are pretty well covered for this year, and through the first quarter but little iron has been contracted for the second quarter. Furnaces refuse to sell until something more definite is known as to probable production costs after this year.

Bank Stacks Because of Coal

Philadelphia, Dec. 2.—Effects of coal situation already are visible in the eastern blast furnace industry. The Bethlehem Steel Co. because of the fuel shortage has banked four stacks at South Bethlehem and two at Lebanon and is using a 10 per cent anthracite mixture at the remainder of its South Bethlehem furnaces. The pinch is beginning to be felt by other furnaces. One Central Penna stack unable to get steam coal is using coke under boilers. In view of the fuel situation as well as the sold-up condition, the furnaces are even less willing than before to book new tonnage. Frightened consumers have some large inquiries out. Several users would buy all way up to 15,000 tons of foundry iron each for first half. The avidity to purchase is shown by the fact that the Virginia Iron, Coal & Coke Co. in brief period it was in market sold 5000 tons for spot and 15,000 tons for first quarter. Most makers now are out of the market altogether without any price since they find any quotation they name is eagerly snapped up and they do not want additional business since orders now on books seem sufficient to take up 50 to 75 per cent of their first half output. One eastern Pennsylvania maker asked $40 furnace for No. 2 (2.25 to 2.75 silicon) and sales resulted. When he asked $41, business resulted. A small lot of No. 1X (2.75 to 3.25 silicon) offered at $43 eastern Pennsylvania furnace was snapped up immediately. On the other hand some eastern Pennsylvania foundry iron was sold the past week at $36 and $37 furnace for No. 2X. Some central Pennsylvania iron was sold for first quarter at $36 furnace for No. 2 plain (1.75 to 2.25 silicon), $37.25 for No. 2 X and this is minimum. The lowest for Virginia iron for any shipment now is $35 furnace for No. 2 plain. $37.25 to $38 for No. 1X and only December-January shipment is obtainable. Malleable has been sold for first half at $37 eastern Pennsylvania furnace. Several thousand of basic for next year were sold at $32 eastern Pennsylvania furnace; also a couple thousand tons were sold at $35 eastern Pennsylvania furnace. Some inquiry is out for basic. The Midvale Steel & Ordnance Co. has blown in another stack on basic. From 4000 to 5000 tons of copper-bearing low phosphorus were sold at $37 furnace.

Coke Market Moves Up

Spot Furnace and Foundry 50 Cents Higher—Sliding Scale Contracts Net More—Fixed Price Agreements Made Subject to Costs

Pittsburgh, Dec. 2.—Beehive furnace coke is decidedly stronger both on prompt and contract shipments. Several good-sized first half contracts have been closed on sliding scale agreements carrying a ratio of 5 to 1 on basic pig iron, valley furnace. On the present price of $33, for basic iron, shipments against these contracts, would carry a price of $6.67, ovens. The advance in basic also has materially enhanced the theoretical value of first half contracts made on a basis of 5½ to 1, which today would carry a price of $6, ovens. It is understood that 40,000 tons were closed by one interest on the basis of 5 to 1 for first half and also that 6000 tons for first half have been sold at a flat price of $7.50, ovens, without wage increase clause. Fixed price contracts have passed from favor, due to the inclusion by operators of a clause providing the buyer shall pay 50 per cent of any increase in coal or coke producing costs during the life of the contract. Notice has been posted in the Connellsville regions of the 14 per cent increase in wages; although this is a nonunion field, operators made the increase as a protection to their working organizations. Assuming a labor charge of $1.50 per ton of coal mined, the increase is 21 cents per ton, and on a basis that it requires 1½ tons of coal to produce a ton of coke, the increase in coke is 31½ cents per ton, and with buyer and seller sharing equally in the increase, the fixed price contracts made at $6, containing this provision, now will carry $6.15¾, ovens. It is stated that the labor cost in the Connellsville region averages considerably less than $1.50, this price being used merely for purposes of illustration, since it has the authority of government statisticians. It is feared a further advance will be necessary to bring about a return of the union miners and normal coal production. The nonunion fields, among them the Connellsville regions, will continue to be drawn on heavily for coal so long as other districts are not operating normally. Meanwhile, steel companies are not yet able to secure coal from their own mines, athough there has been no seizure of coal moving by water. Lacking coal for their coking plants, some of these companies are in the market for coke and it is the presence of these requirements that largely accounts for a sharp advance in the spot price. It has taken but a few new demands to send the price of spot 48-hour fuel up 50 cents. No standard furnace coke today is available under $6.50, ovens, and $7 is freely quoted. Prompt foundry coke also has stiffened about 50 cents now being rated at $7 to $7.50. The contract foundry coke market is nominal. Connellsville production of coke in the week ended Nov. 22, is estimated by *the Connellsville Courier* to have been 231,204 tons, against 253,024 tons in the previous week.

Coke Supplies at Low Ebb

Boston, Dec. 1.—Deliveries of coke from all sources are falling behind and several foundries have been anxiously endeavoring to get at least partial deliveries in order to keep their plants running. The New England Coal & Coke Co. has announced the price of $11.40 to govern December sales under its sliding scale contracts. The spot price on any coke it may have outside of contracts is $11.90. Some Connellsville coke has reached this territory at $11.40, delivered. The Everett, Mass., by-product plant recently has placed in operation another bank of ovens.

Some Makers Stop Selling

New York, Dec. 2.—An exceedingly active business has been done in coke here during the past week. Western Pennsylvania foundry coke has been booked for first half at $6.50 to $7, Connellsville. In some cases the contracts specify an advance in the cost of labor is to be added to the price. Numerous large lots were included, one being 5000 tons. Because the government may cut off the supply of coal to coke ovens, a number of the beehive interests have withdrawn from the market. The last price on spot foundry quoted by one of these interests was $7.25, Connellsville. The northern New Jersey by-product maker is ranked in the public utility class. Hence, this interest continues to receive a supply of coal. However, its receipts have been cut down and its operations now are around 85 per cent.

Virginia Fuel Higher

Cincinnati, Dec. 2.—Coke prices in the Wise county and New river fields especially, are higher. The nominal figure named for Wise county foundry ranges from $10 to $11, depending upon the shipment. Some spot foundry was offered in that field yesterday as high as $11.50. Connellsville furnace ranges from $5.75 to $6.25 ovens and foundry from $6.75 to $7.50. Pocahontas producers have practically sold no coke in this territory during the past few weeks. New River foundry coke is very scarce and as high as $13 has been asked, but the nominal quotation ranges from $11.50 to $12.

Buyers Covering at Advances

St. Louis, Dec. 2.—All grades and varieties of coke continue in excellent demand, with a well defined upward trend in values. There was some contracting in the week for first half at from 50 to 75 cents higher than for this year. There is a disposition on the part of all users in this district to hasten to cover. Foundry coke is bringing from $7 to $7.50 ovens according to quality.

Scrap Market Is Varied

Some Districts Show Little Effect of Coal Situation—Unsettled in Others—Bid $24.50 to $25 For Steel

FOR COMPLETE SCRAP PRICES SEE PAGE 1554

Chicago, Dec. 2.—Although lack of fuel, due to the miners' strike, has caused a number of scrap consuming plants to close down and probably they will not resume operation during the present year, the effect of this shortening of consumption has not yet been felt in the market for iron and steel scrap. Foundry grades are exceptionally strong, with prices advancing as pig iron goes to higher levels and supply inadequate to meet demands. No 1 wrought has been in heavy demand in spite of the fact that most bar iron mills are shut down from lack of fuel. Rerolling rails are quiet but all this material offered is taken readily. As to heavy melting steel, mills are not taking heavy tonnages at present, as they have bought freely recently. Dealers, however, are taking whatever is offered and will hold it for future needs. The Chicago & Northwestern has offered 5460 tons in which is included 1000 tons of No. 1 rails and 500 tons of No. 1 wrought. The Chicago, St. Paul, Minneapolis & Omaha offers 825 tons, the Kansas City Terminal 320 tons, and the Chicago, Burlington & Quincy 150 tons.

High Prices in New England

Boston, Dec. 2.—Last week marked the close of the best scrap iron and steel month of the year for New England brokers. Blast furnaces, steel mills and foundries all have continued to make strong demands. No. 1 machinery continued to advance until it reached $34.50, delivered. Other grades have advanced. Chemical borings sold at $18, shipping point, and turnings at $15. A sale of 1000 tons of rerolling rails was made at $27, shipping point. Pennsylvania steelmakers, particularly in the South Bethlehem district, have been large buyers of heavy melting steel, and although the price of this grade has not advanced proportionately, the market has remained firm and dealers are ready to pay $17.50 for the right quality. Several large sales of wrought pipe advanced the price to $18. The Boston district ordnance office continues to sell scrap brass and steel.

New York Buying Subsides

New York, Dec. 2.—Buying by the mills which featured the local scrap market last week has subsided and at present activity is being confined principally to brokers. These interests are not only buying for future speculation, but are covering, in some instances, on sales already contracted. Holders, however, are parting with their material slowly, and as a result the actual volume of trading in the past week has not been large. Prices on some descriptions continue to advance steadily. Heavy melting steel is now holding at $18 to $18.50, f.o.b. New York, an advance of 50 cents. It has been reported Pittsburgh consumers have been shopping around in the East, and have offered $25, Pittsburgh.

Steel Tonnages Sold

Philadelphia, Dec. 2.—The Alan Wood Iron & Steel Co. bought 5000 tons of heavy melting steel past week at $22.50, delivered. The American Bridge Co. at Pencoyd also bought heavily but the size of this tonnage is not known. This interest has been buying direct from producers and has been bidding as high as $24.50, delivered, and thus is advancing the market and making it still harder for other consumers to buy at lower prices. Generally the

Coal Shortage Effective

Pittsburgh, Dec. 2.—Although the scrap iron and steel market has been showing a strong upward tendency and materially higher prices have been established on a number of grades by actual sales, the coal shortage has become so acute at a number of steel plants as to result in suspension orders against shipments and in the past day or two the market has lost much of its buoyancy. It has been rumored that a Pittsburgh district steel company recently closed on 10,000 tons of heavy melting steel in excess of $26, delivered, but confirmation is lacking. The steel companies who have been in the market for supplies, however, admit making bids of $24.50 to $25, delivered, without securing any considerable amount of material. Dealers are asking from $26 to $27, delivered on this grade. A valley maker of sheets is among those who have stopped shipments against orders, as a result of the coal shortage and a valley blast furnace interest also has suspended shipments. A good market exists in steel axles, which can be rerolled into merchant bars, of which there is an acute shortage. Rerolling rails are not bringing more than $27 in this district, but are readily salable at much higher prices to West Virginia and Ohio makers of light sections.

Offer $23.50 For Steel

Buffalo, Dec. 2.—There is practically no heavy melting steel to be bought in this market, despite the fact that $23.50 is being offered for it. One mill in this district which has practically covered for three months, apparently has taken all the available scrap, and the broker handling the transaction is having a great deal of difficulty in obtaining the 25,000 tons for which $23.50 is being paid. Dealers are expecting a further advance in heavy melting steel. They are holding on to their stocks and are not inclined to let it go at that figure.

Market Looks Softer

Cleveland, Dec. 2—The outlook here for scrap iron and steel is unsettled. So far any weakness is not pronounced—it is more sentimental than actual—but most dealers do not look for a strong, healthy market until after the middle of January. Practically all of the local consumers of heavy melting steel have dropped out of the market. Buying in the valleys also has ceased. Up to $25.50 is reported having been paid for shells, on long delivery, and up to $24 for No. 1 railroad steel, but steel now can be bought in the valley for $23. Prices in the main are unchanged, but many are nominal in the absence of trading, and practically all are soft.

Cincinnati Market Backward

Cincinnati, Dec. 2.—The scrap market is not so firm and advances in pig iron have not yet been reflected in it. While the foundries are consuming large quantities of scrap, a number of steel mills supplied by this center, have been closed down for want of coal. This has necessarily cut down outside shipments materially and dealers' stocks now are increasing at a fairly rapid rate.

St. Louis Market Recovers

St. Louis, Dec. 2.—The iron and steel scrap market has run into a typical spell of watchful waiting. The scare which overtook dealers and yardmen last week and caused them to desire to ship material on contracts and sell, disappeared almost as suddenly as it came. Prices have held firm, with two or three advances noted, but business during the week has been extremely light. The position of consumers still is that they can not accept shipments, because of inability to get coal. The leading rolling mill interest has closed down on that account, and unless things improve, others will follow soon. This is a discomfiting influence. However, dealers see that the coal strike must end presently, and that demand be returned to the point where present fuel trouble found it. Steel is in fair demand, and heavy melting is quoted $1 higher at $21.50 to $22. Some fair sales of this grade have been made, one of 1000 tons to a local melter. Rolling mill grades remain in status quo. The mills still running have enough on hand for immediate needs, and do not care to take on more at present. Rerolling rails were marked up $31 to $32. Cast scrap is wanted and the same is true of malleable, but transactions are at a minimum. The railroads had no lists before the trade. One dealer in Texas was offering 3000 tons of railroad scrap in this market. Country dealers are beginning to offer tonnages. They are anxious to clean up their stocks.

Southern Inquiry Active

Birmingham, Ala., Dec. 2.—Old material is in demand and liberal inquiries are being received by dealers in Birmingham. The belief is now strong that there will be a strong market for scrap in quantity during the coming year. Foundries and machine shops, steel mills, cast iron and sanitary pipe plants and others who use more or less tonnage are well supplied with orders and there will be constant operation for an indefinite period. Scrap prices not only

are strong but are up considerably over 30 days ago. Heavy melting steel is not so firm however, consumers offering less than the published figures and apparently getting a supply.

Little Tin Plate

To be Available in Open Market For First Half

Pittsburgh, Dec. 2.—In view of the fact that the 1919 business which will constitute a prior lien on early 1920 production amounts to about 8,000,000 base boxes, or about 400,000 tons and is equivalent to 25 per cent of the theoretical annual capacity of the country, it is evident that makers will have only extremely small tonnages available for other than their regular customers. As a matter of fact, the American Sheet & Tin Plate Co. accompanied the announcement of the opening of its books for first quarter and first half of 1920 with an announcement that it would be obliged to allot its production and this company is known to have about all the business it can meet for the first three months of next year. It appears that the independent manufacturers are heavily committed and the best that manufacturers possibly can do will be to look out for the requirements of their regular customers. Although considerably more than $7 per base box, Pittsburgh, could be obtained today for standard tin plate for early delivery, makers generally are disinclined to consider inquiries from other than their usual customers and are not deviating from the $7 base. Independent tin plate manufacturers generally regard $7 as a fair price on domestic business. On export inquiries most makers are quoting $7.50, Pittsburgh, and talk of an $8 market is heard.

Allotted Entire Output

Buffalo, Dec. 2.—So insistent is the demand for tin plate that one manufacturer is said to have allotted the entire output for first half in less than two days from the time he announced his willingness to accept contracts.

Inquiries Are Heavy

Youngstown, O., Dec. 2.—Tin plate inquiries are extremely heavy at Mahoning valley mills. Books are closed, however, and no tonnages are to be had. According to export buyers, tin plate is commanding $8 per base box for foreign shipment and is hard to get at this figure. Considerable tonnage is being absorbed by canmakers and by meat-packing companies.

Strip Orders Large

Pittsburgh, Dec. 2.—Makers of strip steel practically have no tonnage available for delivery during the remainder of this year and the carry-over of 1919 business into 1920 promises to be so heavy that little tonnage will be available during the first quarter. One company in this district which was unaffected by labor troubles is naming February as the earliest time at which it can consider new demands in either hot or cold-rolled steel.

Shape Supply is Less

Mills No Longer Able to Make Early Deliveries—Plain Material Sells at Higher Prices—Awards Are Fair

New York, Dec. 2.—Few awards of consequence were reported in the local structural market in the past week, although inquiries came out at a fair rate. The largest inquiries noted were two lots of 800 tons for a hotel for the Y. W. C. A. in Washington, and a storage house in Baltimore. Mill quotations are tending upward. It is reported that as high as $5 a ton over the Pittsburgh base of 2.45c has been quoted on nearby shipments. As yet, however, the majority of the mills are adhering to the old level. It is expected that by the first of the year all of the independents will have advanced their offerings. What the leading producer will do is problematical but according to the best advices now obtainable, there will be no change.

New England Demand Grows

Boston, Dec. 2.—An active demand for structural steel is reported by Boston dealers. Prospective builders have been waiting in the hopes of finding reduced prices for steel construction work, but with the present rising market and the uncertainty ahead they are now becoming anxious and contracts for New England construction in the early spring are heavier.

Difficult to Place Tonnage

Philadelphia, Dec. 2.—Very few structural mills are in a position to take shape business for anything but deferred delivery. It is difficult to place any tonnage for anything this side of four to six weeks. Some eastern makers are taking on no new tonnage that does not net them 2.60c to 2.65c mill and some small lots are being taken at higher figures.

Prospective Business Big

Pittsburgh, Dec. 2.—While only a few structural projects of any size have come to fabricators in this district recently, it is stated that the volume of inquiries still is rising and expectations run strong that the turn of the year will see a large number of them closed. The McClintic-Marshall Co. has been awarded 4000 tons for the new turbine plant of the Westinghouse Electric & Mfg. Co. at Essington, Pa.

Building Tonnage Steady

Chicago, Dec. 2.—Placing of structural shapes is going forward in good volume, the largest project closed recently in the West involving 4370 tons for a storage and manufacturing plant for the A. O. Smith Corp. at Milwaukee. The Scottish Rite temple at Bloomington, Ill., requiring 319 tons, which was first awarded to the Decatur Bridge Co., has been given to the Bloomington Construction Co., on a revised bid. Plain material is quoted at 2.72c, Chicago.

CONTRACTS AWARDED

Extension to turbine plant Westinghouse Electric & Mfg. Co., Essington, Pa., 4000 tons to the McClintic-Marshall Co.

Building for Scio China Co., Scio, O., 100 tons to the Jones & Laughlin Steel Co.

Second unit of shop extensions for A. O. Smith Corp., Milwaukee, 4500 tons to Worden-Allen Co.

Manufacturing building for American Skein & Foundry Co., Racine, Wis., 175 tons to Worden-Allen Co.

Hide house for Pfister & Vogel Leather Co., Milwaukee, 500 tons to Worden-Allen Co.

Skip hoist and ore bin for Thomas Furnace Co., Milwaukee, 300 tons to Worden-Allen Co.

Washing plant for Cleveland-Cliffs Iron Co. at Hibbing, Minn., 300 tons to Worden-Allen Co.

New buildings and general alterations for Newport Chemical Co. at Carrollville, Milwaukee county, Wis., 400 tons to Worden-Allen Co.

Building for the Coca Cola Co., New Orleans, 409 tons, to Virginia Bridge & Iron Co.

Scottish Rite Temple for Bloomington consistory, Bloomington, Ill., 319 tons, to Bloomington Construction Co.

Building for the Post Printing & Publishing Co., Denver, Colo., 254 tons, to Denver Steel & Iron Co.

Warehouse for the Russell Grader Co., Cicero, Ill., 107 tons, to Midland Structural Steel Co.

Building for Upjohn Co., Seventh avenue, New York City, 300 tons, to Geo. A. Just & Co.

CONTRACTS PENDING

Trusses for Drake Hotel, Chicago, 200 tons, bids asked on revised plans.

Y. W. C. A. hotel, Washington, 800 tons, pending.

Telephone exchange in Bronx, New York City, 300 tons, bids in.

Church in Holyoke, Mass., 200 tons, bids pending.

Proof shop at Washington navy yard, 300 tons, general contract to Stang & Mitchell, Philadelphia.

Power house for Leaver Bros., Cambridge, Mass., 300 tons, bids pending.

Storage house for fertilizer plant of Guano company, Baltimore, 800 tons, bids pending.

Sellers' Market

Rules Completely in Wire Products—Higher Nail Extras Agitated

Pittsburgh, Dec. 2.—The market for wire products, particularly for nails, is purely a sellers' affair. Practically all companies in this district are out of the market and quotations for that reason merely are nominal. It is understood, however, that one of the smaller companies recently took an order for 5000 kegs for delivery over the first quarter at 6.60c, base, Pittsburgh, and there are unconfirmed rumors that one of the larger independents has taken business as high as 7.00c, base Pittsburgh. In the opinion of some makers a famine of nails is probable, not because of a lack of productive capacity so much as because prices have been so unprofitable that much machinery has been allowed to remain idle. Only through an increase in the base price or the introduction of a new card quoting higher extras, it is stated, will the larger independent companies resume production on the scale warranted by the demand. Next year's requirements of nails are estimated at 20,000,000 kegs. The present nail card was established in 1896. Demand for wire is only slightly less insistent than for nails. Little progress has been made in cutting down the accumulation of orders piled up as a result of the strike. One company not affected materially by the steel plant strike has withdrawn from the market owing to the possibility of being obliged to suspend from a scarcity of coal.

Bar Orders Very Heavy

Buyers Continue to Seek Position on Mill Books Despite Deferred Deliveries—Making Sales on Higher Basis

Chicago, Dec. 2.—Consumers of soft steel bars find difficulty in placing their orders, as the leading independent is entirely out of the market, having little remaining tonnage for first half, and the leading interest is accepting contracts subject only to delays. Orders for bars are heavier than for any other form of finished steel, and books are heavily loaded. In spite of this fact, new business is coming in large volume and consumers show much anxiety to get a position on mill books for as early delivery as possible. The leading interest is nearly sold out on its entire tonnage for first half of 1920. No difficulty has been experienced yet on account of the coal strike, and consumers have not asked to have deliveries delayed, apparently being willing to take in their raw material even though forced to shut down for lack of fuel. The quotation is steady at 2.62c, Chicago.

All mills producing bar iron in the West are shut down for lack of fuel and none of this product is being turned out. The idleness forced on these mills is the more irksome because of the excellent tonnages on books and the heavy demand which would have given steady operation for many weeks. In spite of inability to produce, mills are able to take on additional tonnage, subject to delay. The quotaton ranges from 2.77c to 3.00c, Chicago mill.

Several producers of rerolled high carbon bars have been forced to shut down by lack of coal with large tonnages on their books. Practically no new business in this material has been booked for some time, the most recent quotation being 2.85c, Chicago.

Impossible to Buy Tonnage

Philadelphia, Dec. 2.—With the developments in fuel situation, it is almost impossible to buy steel bars from the mills. Considerable tonnage for next year has been sold the past week at 3.00c and 3.25c Pittsburgh for commercial quality and at 3.50c for forging quality but the mills now are out of the market having sold about all they can make for the first half.

Shortage Still Unrelieved

Pittsburgh, Dec. 2.—A shortage of merchant steel bars bordering on the famine stage still exists and buyers in need of early tonnages are naming extremely high prices in an effort to cover. On a small tonnage of small size oval bars a price of 7.00c base Pittsburgh recently was offered and on squares and rounds, bids of 2.75c and 3.00c Pittsburgh have been common. The market actually is quotable anywhere from 2.35c to 3.25c Pittsburgh, for the Carnegie Steel Co. still is taking some business at the lower figure although shipments against such orders cannot be made until well into 1920 because of the business backed up as a result of the strike. As yet little headway has been made in cutting down accumulating bookings. Small sales by independent companies are being made at 2.75c to 3.25c for prompt shipment. Forging bars are in extremely scant supply since because of scarcity of labor and the extra work required in making forging billets, production of the latter is extremely low. Makers of iron bars still are flooded with business and most of them now are so heavily committed as to be indifferent to demands except from regular customers. The recent price of 3.25c Pittsburgh for common bars is firmly maintained. The Pennsylvania railroad, lines west, recently closed on 650 tons of iron bars at 2.75c base Chicago, for common bars and 2.90c base Chicago for specification iron.

Demand is Strong

Buffalo, Dec. 2.—There is a strong demand for bars, particularly for forging purposes. Bar mills here are operating and are getting fair production.

Acute Shortage Exists

Pittsburgh, Dec. 2.—The past week has seen little or no improvement in the supply situation in merchant steel bars and makers of cold-finished steel bars dependent on outside sources for their merchant bars still are operating on a much curtailed program. New demands, especially for the smaller sizes of rounds, flats and squares, cannot be entertained by these manufacturers. One company here which makes its own merchant bars recently withdrew from the market until it ascertains whether the scarcity of coal is going to affect plant operations. While all companies are quoting 3.60c, base Pittsburgh, buyers will pay much more to secure desired material.

Bar Shortage Prevails

Chicago, Dec. 2.—In the face of unusually heavy demand for bolts and nuts and larger inquiry than mills could handle were they able to operate at full capacity, most producers face the possibility of a shut-down from lack of bars.

Prices Still Headed Higher

Pittsburgh, Dec. 2.—Still higher prices have been established on both bolts and nuts because demands continue heavy and makers already are so heavily committed as to be indifferent to new business except at more attractive prices. Current production is far behind contract requirements due to the scarcity of bars and much business has been backed up by this condition. Carriage bolts now are not being booked for less than 45 and 5 off for round thread and 45 and 5 off for cut thread in the smaller sizes, while larger sizes are taking flat discounts of 30 and 10. Rolled thread machine bolts are quoted at 50 and 7½ to 50 and 10 off and cut threads at 40, 10 and 5 off for the small sizes and 40 off on the larger sizes. Nuts are quoted at 2.50c off on blanks and 2.25c on capped. Track bolts have been sold at 5.00c Pittsburgh in carloads and 5.50c plus one cent a pound extra for less than carloads. Rivets are holding at 4.15c for structurals and 4.25c for boilers but some makers still are selling at 4.00c and 4.10c respectively.

Sheet Tonnage Is Scarce

Pittsburgh, Dec. 2.—While much talk is heard of premium business in sheets for early delivery, this refers to only a small tonnage compared to the whole. The American Sheet & Tin Plate Co. is not deviating from the March 21 prices for the first half of 1920 and while some of the independents have accepted some business at an advance, it is declared that the average on all bookings is close to the old figures. Regular customers are having such business as the mills can take placed on the books at the regular basis. Neither the leading interest nor the independents can take on much additional business, for the loss of production during the strike was considerable and this tonnage must be accommodated out of production for the early part of next year. Making up this loss, it is figured, will take the better part of the first quarter and this only if no further disturbance of labor occurs and the coal scarcity does not interfere. The latter danger is imminent and it is reported that some western mills already have been obliged to suspend. While the American Sheet & Tin Plate Co. is taking orders for the first half, the independents are not committing themselves beyond the first quarter. On most of the business being booked, 4.35c, Pittsburgh, is the base on black sheets, 5.70c on galvanized and 3.55c on blue annealed.

Holds No. 10 at 3.75c

Philadelphia, Dec. 2.—The leading eastern maker now has minimum on No. 10 blue annealed of 3.75c Pittsburgh. Some first quarter contracting has been done on this basis although business is being turned away in volume. Premiums continue to be paid on all kind of sheets.

Large Premiums Are Offered

Youngstown, O., Dec. 1.—Sheets continue extremely difficult to obtain from Mahoning valley plants. Virtually all mills are booked through the first quarter and are not offering beyond that period. Dealers who have combed this territory for any grade find material almost unobtainable. Despite this sold-up condition buyers continue to send in heavy inquiries, with blue annealed and galvanized in the greatest demand. Premiums are running wild, almost every inquiry having an offer of this character attached. So far as can be

learned little business of this class has been entertained by valley mills.

While no mills have been forced to close on account of the fuel shortage, still this condition must be considered. The steelmaking department of one sheet producer already is idle and part of another is expected to close this week unless the situation improves. A shortage of steel means a shortage of sheet bars and perhaps another jump in the price of semifinished material. Consequently sheetmakers here are going slow not knowing what is before them.

Sheet quotations in the Mahoning valley are nominal. In many instances buyers have offered $15 per ton premium for light-gage blue annealed and galvanized for spot delivery and yet have been unsuccessful in obtaining these. A certain buyer is in the market for about 1500 tons of galvanized, No. 26 and lighter, and is willing to pay considerably over $20 a ton premium. If sheets were available at valley mills blue annealed would carry a quotation between 3.90c and 4.25c; black, between 4.65c and 4.85c; and galvanized around 7.50c. One large automobile maker in the Detroit district has bought sheets on a premium basis on several occasions recently and in as large a quantity as he could get. Few wasters are to be had. Buyers have been eager to obtain any kind of sheets and have absorbed waster stock along with primes. Consequently, prices of nearly all sheet mill by-products have stiffened. Galvanized seconds are quoted between 5.50c and 5.70c; fine finished seconds, between 4.60c and 4.75c; and pickled seconds, between 5.25c and 5.50c base.

Ferro Selling At $120

Round Tonnage Sales Establish Market at Recent Advance—English Metal Offered at $115 Delivered—Spiegel Also Higher

New York, Dec. 1.—Domestic makers of ferromanganese who put up their price on 78 to 82 per cent metal a week ago, to $120 delivered, have made sales of round tonnages during the past week for next year at this figure, and it is believed that this now represents the market on domestic standard metal for any delivery. However, English metal now is offered at less than this figure. One importer has been cabled by his English principal, an authority to sell 76 to 80 per cent English metal for first quarter at $110 tidewater, which is equivalent to around $115, delivered at consuming plants. English makers, however, during the week refused to consider bids of $110 delivered from domestic consumers for large tonnages. Domestic inquiry now amounts to 4000 to 5000 tons. In addition, there is an inquiry for 1000 tons for shipment to South America.

Spiegeleisen advanced during the past week. About 1500 tons of 20 per cent metal were sold for domestic use at $37 to $38 furnace, and there are inquiries for several thousand tons from domestic sources. There are also big inquiries from abroad involving many thousands of tons. These inquiries come from Holland, Belgium, France and Germany. The unfavorable exchange situation acts as a bar to the closing of this business.

Some additional inquiries for small tonnages of ferrochrome for next year, in addition to the 12,000 tons recently reported, have appeared. The price of standard ferrochrome, containing 6 to 8 per cent carbon, is 27 to 29 cents per pound contained, although it is rumored there has been some cutting. Alloy containing 1 to 2 per cent carbon is quoted 70 to 75 cents per pound.

The market for ferrotungsten is extremely dull. Foreign alloy still is available at $1 a pound contained and lower, while domestic makers continue to ask $1.10 to $1.20 a pound contained, at which they are taking a little business.

The 50 per cent ferrosilicon market is dull. While a few consumers of this metal have contracted for next year, the majority appear to be waiting, possibly intending to buy from hand to mouth. The market on 50 per cent remains about $80 to $85, delivered, and on 75 per cent, $145 to $150. A quotation of $250, Montreal, recently was paid on some 90 per cent, to which would be added freight and 15 per cent duty.

Ferro Sales Made at Advance

Pittsburgh, Dec. 2.—The recent advance in 80 per cent domestic ferromanganese to $120 furnace, freight allowed, has been paid in several small lot sales in the past week and this price represents the minimum figure of all makers. At the moment, English makers are not a factor. The strong pig iron market now is a factor in ferromanganese. Since this material is produced largely in blast furnaces, makers, in the failure to profitably produce ferromanganese, can turn to pig iron at remunerative figures.

Spiegeleisen is held at $40 to $45, furnace, for 18 to 21 per cent material but the last business of any account in this material was around $35, furnace.

Recent stiffening in the price of 50 per cent ferrosilicon appears to have been only partly sustained, for buyers seem to have been frightened. There is a lack of sales at the higher asking prices. The asking price runs from $85 to $90 furnace, freight allowed, generally, but it is known some Canadian material is in the hands of middlemen bought at a price at which it could be profitably turned over at less than $85.

Bessemer ferrosilicon remains in light demand but prices are firm in the lack of big production or large free stocks. Jackson county, O., makers whose furnaces have been down for several months are resuming.

Demand and Price Up

Chicago, Dec. 2.—Considerable activity has developed in ferroalloys, and two sales of 500 tons each of ferromanganese recently were made in this district at $120. There is some other inquiry which has not yet been satisfied. A sale of 300 tons of 50 per cent ferrosilicon was made recently at $90, delivered. Spiegeleisen is now quoted at $45, eastern furnace.

Car Plates In Demand

New York, Dec. 1.—About 80,000 tons of rolled plain material largely plates will be required for the 5500 tank cars recently distributed by the Union Tank Car Co. With the axles and wheels 100,000 to 110,000 tons will be required for these cars.

Eastern Demand is Huge

Philadelphia, Dec. 2.—Plate makers are swamped with demand and some say they could sell enough to take entire 1920 output. Practically every eastern shipyard has out inquiries. A Baltimore yard placed 5000 tons with the leading interest at price reported to be 2.50c Pittsburgh which compares with 2.75c Pittsburgh done by some eastern makers on first quarter contracts and 2.85c eastern mill done on some small tonnage. The Standard Oil Co. of California is in the market in New York for four to 10 tankers requiring about 15,000 to 40,000 tons of steel.

Most Makers Hold to 2.65c

Pittsburgh, Dec. 2.—Although the plate market must be quoted from 2.50c to 2.65c, Pittsburgh, in view of the fact that the lower price recently was named by the Carnegie Steel Co. against a shipbuilding inquiry, makers in this district generally are holding to 2.65c and claim ability to obtain that price on tank plates. The Standard Oil Co. is reported to have put out an order for 20 oil storage tanks, the first part of a total for 200. Builders of oil and gas tanks are extremely busy at present, not only on domestic, but on foreign orders. Demand for plates in connection with this business is large and urgent and all makers have substantial bookings. Pittsburgh district car builders have only a moderate amount of business before them at present.

Plate Mill Operating

Buffalo, Dec. 2.—The Donner plate mill now is in operation. It went into production last week for the first time, since the tie-up as a result of the steel strike.

Demand Continues Strong

Chicago, Dec. 2.—Inquiry and sale of steel plates continue strong, most of the demand resulting from continued activity in the production and transportation of oil. Demand for shipbuilding has been held up and not much business is being booked from this source. Most of the plates now needed are for tank cars and oil tanks, although other users of plates are in the market for their usual requirements.

Railroad Demand

On Increase—Orders Pending in East —Car Inquiry Heavy

New York, Dec. 2.—It is estimated that the rail tonnages which now are under negotiation for 1920 in this district total about 375,000 tons. Of this total, the New York Central is expected to take 150,000 tons, having cut down its requirements to that figure. Practically as much, it is expected, will be taken by western roads who do their purchasing in New York and the remainder will be taken by the Erie, Lackawanna, New York, Ontario & Western, Lehigh Valley, Central of New Jersey, Delaware & Hudson and smaller roads having their headquarters in this territory. The Erie already has placed 28,000 tons and the New York Central is expected to distribute its tonnage this week.

The orders for tank cars just placed by the Union Tank Car Co. constitute the biggest business which has been closed by one interest at one time in the history of the tank car trade. The Union Tank Car Co. just has added another 1000 cars to its order with the Standard Steel Car Co., making a total of 3500 to be made by the latter interest. As the business now stands, the Standard Steel Car Co. will build 3500 cars, the Pressed Steel Car Co. and the Cambria Steel Co., 750 each, while the Union Tank Car Co. will build 500 cars in its own shops at Lima, O., thus making a total of 5500.

Many Rail Orders Pending

Philadelphia, Dec. 2.—Since the Pennsylvania placed its order for 186,000 tons of rails which may be increased, many other roads have given an idea as to their tonnage needs for 1920. The Reading is expected to buy about 25,000 tons for itself and the Jersey Central. The Baltimore & Ohio is expected to buy 75,000. The Norfolk & Western took bids on 26,000 tons but has reached no decision. The Virginian wants 16,000 to 18,000 tons.

While some makers still are willing to book rails on basis of $47 mill for open-hearth, one mill is asking $57 mill.

Rail Tonnage Still Open

Cleveland, Dec. 2.—The Pere Marquette railroad has reached no decision on 37,000 tons of rails on which it took bids week or 10 days ago.

More Car Inquiry

Chicago, Dec. 2.—The Great Northern railroad is inquiring for 1000 cattle cars requiring about 350 tons of plates and shapes, and 1600 tons of axles. An inquiry is now current for 3000 freight cars requiring 35,000 tons of plates, shapes and bars and 5000 tons of axles. It develops that the contract for 1000 tank cars recently placed in the West and supposed to be a portion of the purchase by the Union Tank Line Co. is for 1000 tank cars for the Gulf Refining Co., which went to the Standard Steel Car Co.

Negotiations for about 300,000 tons of standard steel rails for western railroads are practically complete but the sales are contingent on the roads being turned back to their owners at the end of the year.

Heavy Tonnages

Involved in New Line Pipe Orders— Western Cast Pipe Up

Pittsburgh, Dec. 2.—Several inquiries for line pipe recently have come before makers in this district and one involving 400 miles of 8-inch pipe for delivery next spring has been placed. This came from the White Oil Corp. and is for shipment to the southwest. The National Tube Co. took 225 miles of the order, the Youngstown Sheet & Tube Co. 100 miles and the remainder was scattered among other producers. It is reported that the Standard Oil Co. is planning to connect up its California and northern Texas holdings with an 8-inch pipe line which would involve the purchase of approximately 140,000 tons of pipe. Another inquiry from the southwest calls for 750 miles of 8-inch pipe and in view of the fact that manufacturers also have before them a number of inquiries from the United States of Columbia and Mexico, it is more than likely that before Jan. 1 they will be booked to capacity on this class of tubular goods for the whole of the year. Pressure of inquiries for oil goods are heavy. Although demands for merchant pipe are small in comparison with those for the larger sizes, four to five months is the best delivery that the National Tube Co. is offering on buttweld sizes and other producers are naming even longer dates due to the fact that they have been more seriously affected by the strike.

Premium Prices

Rule on Limited Sales of Semi-finished—Report $50 Billets

Pittsburgh, Dec. 2.—Good demand is noted for billets and sheet bars with buyers prepared to pay substantial premiums in order to obtain tonnages, but actual transactions are much restricted because of the lack of supplies. Makers generally are committed against practically all of their current production and are inclined to meet these obligations before entertaining new inquiries. As nearly as the market can be gaged, sheet bars are quotable at $45, Pittsburgh or Youngstown, and 4 x 4 billets at $42 to $44 with the usual extras for size above and below these dimensions. It is reported that one steel company recently opened its books for first quarter business and named $50 on standard sized billets and on slabs.

Wire rods appear to be quite plentiful, but sales continue to be reported at from $60 to $63 for base grade.

East Sells Still Higher

Philadelphia, Dec. 2.—Sales of billets and slabs the past week in this district apparently totaled more than 15,000 tons. Rerolled billets brought $48 to $50 Pittsburgh or $52 to $54 Philadelphia, slabs brought $50.50 to $52.50 Pittsburgh and forging billets $56 to $60 Pittsburgh. Sales involved mostly rerolling billets and slabs. Large inquiries for rerolling billets are before trade as are also a number of moderate sized lots of forging billets.

The Nonferrous Metals

	‡Copper	Future Straits N. Y.*	†Lead, New York basis	Zinc St. Louis basis	Aluminum	Spot antimony	Nickel ingot
Nov. 26	18.87½	54.25	6.75	7.95	33.00	9.25	42.00
Nov. 27	Holiday	.....	.....	.....	.....	.....	.....
Nov. 28	18.50	54.75	6.75	8.00	33.00	9.25	42.00
Dec. 1	18.00	54.25	6.75	8.20	33.00	9.25	42.00
Dec. 2	18.25	54.25	6.75	8.20	33.00	9.25	42.00

*Future shipment from Singapore.
† American Smelting & Refining Co.'s price.
‡Open market.

NEW YORK, Dec. 2.—The coal crisis, the threat of trouble with Mexico, the steel strike, the erratic movement of foreign exchange, the continued unrest among labor in various trades and districts and the failure of the peace treaty to be ratified constituted conflicting but generally depressing factors which the nonferrous metal markets spent another week in digesting. The lack of goods, abroad and in this country, however, is such that a steady bull force is behind the markets and even the serious obstacles to business at present experienced are not sufficient to stop this force.

The copper market has taken further count of the failure of the peace treaty, on which had been based hopes of renewed large exports of the red metal and copper prices have been pegged lower, until today brought a little reaction and hope, at 18.25c. The lead of the market has passed to the large producers, who have so far departed their recent aloof policy as to develop lower prices than second hands. On Monday electrolytic copper could have been had from large sellers at 18.00c a pound, and possibly a shade lower. Casting copper now is 17.75c to 17.87½c. Lake is 18.50c to 18.62½c. Some second hands have supplies of copper for which they paid more than the current market; these sellers are not now offering freely.

The tin market has been extremely confused by the erratic movements of the markets at London and Singapore. These markets have been chasing each other up, until on Dec. 1 the Singapore price was £299, c.i.f. London. The New York price for Straits has ranged from about 54.00c to 54.50c for spot and futures the past week. Banca was quoted about a quarter cent lower and 99 per cent about half a cent below Straits.

The zinc market recovered still further, on fair inquiry from galvanizers and active demand for export, England, France and Japan being in the market. Producers have not been keen to sell and dealers have been experiencing some little difficulty in obtaining supplies. The market for prime western zinc reached 8.15c to 8.20c East St. Louis, for December and first quarter shipment by Dec. 1, and was firm today at 8.20c.

The lead market was steady at 6.90c, New York basis, for tonnages of more than one carload the past week, held by outside sellers. The leading producer continued to quote 6.75c, New York. The world lead situation continues acute.

The antimony market is unchanged at 9.25c, duty paid, New York.

The price of reamless brass tubing was reduced two cents a pound to 30.50c Dec. 1; seamless copper one cent a pound to 32c base; and today sheet brass was cut one cent to 24.25c, rod to 22.75c, sheet copper 1½ cents to 28.50c, and wire to 21.75c.

Henry Clay Frick

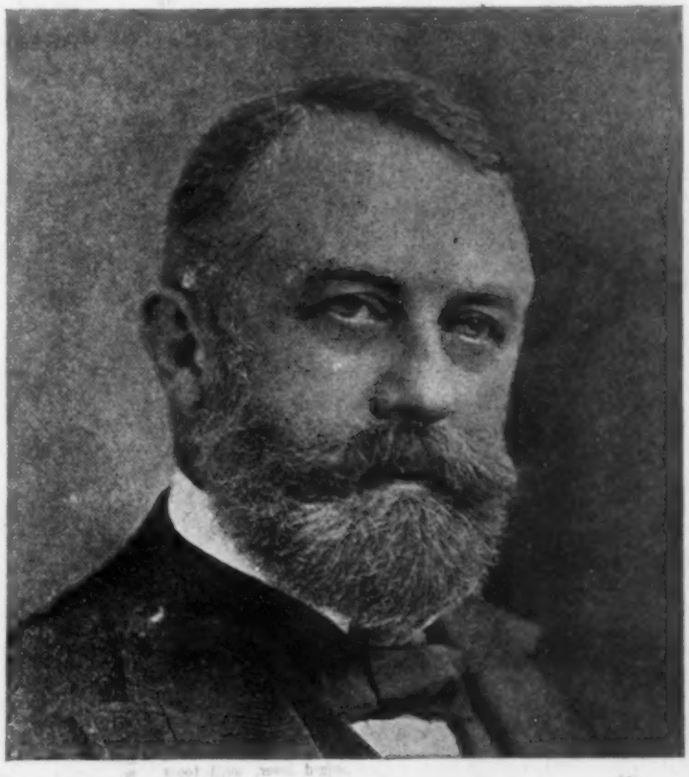
Dec. 19, 1849—Dec. 2, 1919

HENRY CLAY FRICK, whose name and career have been joined with the development of the American iron and steel industry as those of few other men of his generation, died at his home, 1 East Seventieth street, New York City, Dec. 2, from the effects of ptomaine poisoning, from which he had been ill since early in November. Although his illness had been considered serious, his death came as a surprise to his friends and business associates, as he had almost recovered and undoubtedly would have regained his health but for complications which set in. His death was not made public until several hours after he had died. At one time he was the world's largest producer of coke and operated almost 40,000 acres of coal land. Mr. Frick's death brings to a close the life of one of the country's leading business men and great industrial geniuses, who have risen from the ranks through constant effort and untiring energy. He was almost 70 years old, having been born at West Overton, Westmoreland county, Pa., Dec. 19, 1849, the son of John W. and Elizabeth Overholt Frick. His father was a farmer, while his mother was the daughter of Abraham Overholt, a leading miller and distiller of southwestern Pennsylvania at that time. Mr. Frick's early education was received at West Overton, being a pupil at the common school. He later attended for a short term classes at the Chester Military academy, and for a few months was a student at Otterbein university, Westerville, O. When 14 years old, he obtained work in a store at Mt. Pleasant, Pa., receiving small wages and in 1869 he accepted a more attractive position as bookkeeper in the office of his grandfather at Broad Ford, Pa., where his attention was called to the value of coking-coal properties in that section. He interested a number of friends in these deposits and by combining their money a tract of land was bought and 50 coke ovens built.

In the panic of 1873 the price of coke declined but Mr. Frick did not lose faith in the value of what now are the Connellsville coke regions. After considerable deliberation, he appealed to Judge Thomas Mellon, Pittsburgh, from whom he borrowed $20,000, returned to Mount Pleasant and bought out his partners. He then organized the H. C. Frick Coke Co. Immediately after the panic, coke began to advance by leaps and bounds. Not many years later Mr. Frick owned 40,000 acres of coking coal land and 12,000 ovens in Fayette and Westmoreland counties and employed more than 11,000 miners and operators.

Andrew Carnegie purchased the Frick coking-coal properties in 1882, and retained Mr. Frick as manager. It was the purchase of these properties that brought Mr. Frick into direct contact with the iron and steel industry, and despite the fact that he claimed to know little about the manufacture of steel, he became one of the most influential factors in the steel business of the United States. When Mr. Carnegie temporarily retired in 1889, he appointed Mr. Frick active manager of his interests and, with Henry Phipps, Mr. Frick directed the policies of the company. He served as chairman of the board of the Carnegie Bros. & Co., from 1889 to 1892 and later was chairman of the board of managers of the Carnegie Steel Co. He was in active charge of the Carnegie interests until 1900. Much has been written about the so-called "split" between Mr. Carnegie and Mr. Frick, but little ever was

(*Continued page* 1504)



Began Business Life in Country Store.
Foresaw Future of Connellsville Coke.
Started Operations With 50 Ovens.
Finally Owned and Operated 12,000 Ovens.
Became Partner of Andrew Carnegie.
Rounded Out Career as Steel Corp. Power.

Railroad Congestion Hits British

Traffic Troubles Eclipse Coal Shortage as Market Factor and Various Iron and Steel Products Are Scarce—Exports at a Standstill—American Discard Steel is Purchased—Tin Plate Strong

The Iron Trade Review Staff Cable

European Headquarters,
THE IRON TRADE REVIEW,
16 Regent Street, S. W. 1.,
London, Dec. 1.

CONGESTION of the railroads and the shortage of cars and locomotives is the dominating factor in the British iron and steel industry. All iron and steel products are scarce, especially pig iron, billets and sheet bars. The fuel situation has been confused by government price meddling which has lowered the market on household coal and is threatening to advance it on industrial fuel. Nevertheless coal supplies are larger, but this improvement is offset by the railroad congestion.

Pig iron prices are unchanged generally and very firm. The car shortage is compelling many furnaces to pile iron while the melters are becoming short of supply. Middlesboro pig iron exports for November were 11,300 tons compared with 10,300 tons in October.

Thousands of tons of skelp have been placed with Staffordshire mills at £24 ($96.06), which represents an advance of £1 10s ($6.00) due to the inability of consumers to obtain American material. Brisk demand for Welsh tin plate from the continent is current. There is virtually no exporting of British iron and steel materials at present, except pig iron and tin plate.

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation Street,
Birmingham, Eng., Nov. 14.

Rate of Exchange—4.13¼

CLEVELAND had a little surprise this week in the arrival in the Tees of a cargo of pig iron, understood to be Luxemburg basic iron, coming by way of Antwerp. At the present time the vessel is discharging at Stockton and is to take back a quantity of Cleveland iron to Antwerp. It appears that fair quantities of this Luxemburg iron have been sent to Scotland, and the prices, when freight is added, work out at about the same price as Cleveland iron, plus the railway charges of 10s 8d ($2.40) per ton. The taking of Continental iron into Cleveland is rather like bringing coals to Newcastle, and though the details are not known, it is believed that this is an isolated sale at a cut price, to get rid of surplus stock. The incident emphasizes the great demand for iron, especially basic, and Cleveland makers are not much disturbed, as they have a great many more orders than they can fill. In fact, refusals of business are constant.

Basic is particularly scarce just now and consumers are disposed to criticize the authorities who, they say, have taken off too many furnaces from basic to make foundry iron. If the scarcity of this class of material continues, more Continental importations are considered very likely. The great trouble is coal scarcity, aggravated by the shortage of trucks. All the blast furnaces could handle a great deal more business, if they could get the coal and the trucks. It appears that railway trucks are coming back from the Continent at the rate of several hundred a week, and it is hoped that this will gradually reduce the railway difficulties. But already the rigors of an early winter, with their usual effect in hampering transport are being experienced.

A lot of foreign business is held up by the confusion over prices. Foreign buyers, especially, dislike the clause requiring them to pay for any increase in railway rates, and they are disposed only to do business on a fixed basis. Consequently, foreign trade is badly hampered, while the rate of exchange tells very heavily against Italy, France, and Belgium, who will not be good customers until the financial situation has greatly improved.

Business in the Midlands is on a strictly moderate scale. Derbyshire and Northamptonshire prices for forge iron are slightly easier. This is in consequence of a few purchases from Cleveland, where an undue proportion of low quality forge is being turned out by the furnaces, chiefly as the result of the inferior fuel. Some of the northern furnaces are getting rather heavy stocks of forge material. The chief factor discouraging business is the uncertainty as to railway rates and the future price of coal. The authorities have announced that a reduction in the price of coal is pending, but no definite decision has been reached. The Midland furnacemen are not greatly disturbed by the importations from Cleveland, as the quality in that district is not very suitable for Midland purposes. The molders' strike still continues, the men being dissatisfied with the arbitrator's recent award of 5s ($1.03) per week. It is remarkable that the demand for foundry material has scarcely been affected, as iron founders everywhere are buying foundry iron wherever possible, and putting it into stock.

At the Birmingham meeting yesterday there was plenty of new business in steel on offer but makers are accepting orders very cautiously, in view of the impossibility of estimating their costs. When the new price of coal and the alterations in railway rates are known, the whole list of finished material prices will be revised. The high price of coal and its great scar-

Current British Prices

	Home consumption	Export prices
SEMIFINISHED STEEL		
Billets, soft steel	15:10:0 to 16:0:0	15:10:0*
Sheet bars	14:10:0	14:10:0*
FINISHED STEEL		
Steel bars, England, ¾ to 3 inch	18:10:0	18:10:0*
Ship plates, England	18:5:0	18:5:0*
Ship plates, Scotland	21:5:0	21:5:0*
Beams, England	17:10:0	17:10:0*
Beams, Scotland	18:5:0	18:5:0*
Sheets, black, 24 gage	28:0:0	28:0:0*
Sheets, galvanized, 24 gage	37:10:0	37:10:0*
Rails, 60 lbs. and over	16:10:0	16:10:0*
Tinplate, base box, 108 lbs.	2:06:0	2:06:0*
PIG IRON		
Hematite, East Coast Mixed Numbers	10:0:0	10:5:0
Hematite, Scotch	10:10:0	10:15:0
Middlesborough Basic	8:5:0	8:10:0
Middlesborough No. 3	8:0:0	8:5:0
No. 3 Foundry, Derby, Leicester, Nottingham	9:0:0	9:5:0
No. 3 Foundry, Northamptonshire	8:08:0	8:13:0
No. 3 Foundry, Staffordshire	9:00:0	9:5:0
Scotch Foundry	9:15:0	10:0:0
Ferromanganese, 80 per cent	25:0:0	23:0:0
COKE		
Midlands furnace	2:10:6	.....
Midlands foundry	3:6:0	.....

*Export steel prices are nominal.

city are injuring the trade, causing frequent stoppages of production in the Black country.

A peculiar shipment of American steel this week has attracted some attention. One merchant was offered 2000 tons of billets at £10 ($41.20) which he promptly accepted, and another merchant is negotiating for 5000 tons. One cargo of this steel is reported to have already reached a British port. The term billet appears to be rather a misnomer, as the metal is described by the buyers as discard steel. The sizes are irregular and some of the cuttings will be too bulky for use in any mill accustomed to deal with billets. Moreover, the quality has a very limited range of usefulness. The buyers intend to use it for fencing hoops, builders' hoops, and for reinforced concrete purposes, for which there is a very good demand. The present British prices range between £15 ($62.24) and £16 ($66.36).

The molders' strike is beginning to affect the steel trade very seriously. Many of the steel mills cannot go on much longer without renewals of rolls which come from the heavy iron foundries now on strike. Engineering works in all directions are reducing their production daily for lack of castings. The fading of the American steel strike has been quickly followed by a renewal of quotations for American bars. Some American houses are quoting for next quarter's delivery at £19 17s 6d ($81.19) c.i.f., an advance of about 7s 6d ($1.53) on their former terms. Adding transport charges from the port, the price comes out at about £20 17s 6d ($86) delivered in the Black country. Some offers of Belgian material have been made for which £21 ($86.52) would about cover delivery. These prices take no account of rates of exchange, and it is clear that this business would only be possible where delivery is urgently needed.

Although prices in many branches remain nominal, manufacturers find no difficulty in getting advances. Some users of billets who bought very favorably some time ago have had to pay increased charges on their contracts, bringing the value of the billets practically up to the present figure, as they found this was the only way of getting deliveries.

The tin plate boom in South Wales continues, enabling makers to add a further shilling to the price, making the selling figure 45s 6d ($9.31), as against 44s 6d ($9.24) a week ago and 14s $2.88) before the war. The Welsh makers are overwhelmed with orders, chiefly from the Far East and the Continent, where it has been found impossible to obtain American deliveries on current contracts. Galvanized sheets are dearer, orders having been placed this week at the high figure of £37 ($148.44), a rise of 2s ($0.41) on last week's quotation. For galvanized sheets, as for tin plate, the demand is such that buyers are inclined to place contracts regardless of price.

Priority Revived for Fuel Distribution

Washington, Dec. 2. (By Wire)—The central coal committee at a meeting with the beehive coke producers has decided to curtail production of coal for beehive coke ovens on an average of 25 per cent for all regions. Specific averages for the different beehive coke regions are to be given out later. The estimated output in the Connellsville region is to be cut approximately 65,000 tons weekly as a result of this decision. By-product coke output is not affected since no action on this production has been determined upon as yet. The decision is made applicable to beehive rather than by-product coke because the former production is wasteful while the latter affords a supply of by-products for other industries.

WASHINGTON, Dec. 1.—Fuel Administrator Harry A. Garfield today declared that "as far as practicable until the conditions warrant a change, the distribution of coal will be limited to the first five classes of the priority list," which was promulgated by him Oct. 31. Steel industries and other manufacturers, including coke ovens, are not among first five classes except where engaged in production of materials for war, navy and other government departments, which are second on the priority list. This means that the railroad administration will not supply coal to steel and coke industries except where manufacturers' requests are approved by the government department acting as a party to the contract.

Steel manufacturers have been having trouble in getting coal and unless output of mines increases this week and continues so that production approaches normal, there is no hope in sight.

Mine Situation is Cloudy

Only meager reports have been received today as indicating activities at the mines following the strike negotiations here last week and these reports are so scattered as to leave no clear idea of what if any improvement is being made. Manufacturers in the east where coal supply is said to have been better than elsewhere during the strike, report dwindling supplies and except for the production of steel for the government, mills likely will be forced greatly to curtail operations if not to shut down entirely.

Mr. Garfield's statement while not actually in the form of an order so places the burden upon the railroad administration that it has the effect of an order. The statement follows in full:

Since it is necessary that coal shall be used only for essential purposes, public utilities consuming coal should discontinue to furnish power, heat and light to nonessential industries and should only consume sufficient coal to produce enough light, power and heat to meet the actual urgent needs of the people. Advertising signs and displays of various kinds necessitating the use of coal should be curtailed and no coal should be distributed for such purposes. Pursuant to this policy I have requested the railroad administration in the distribution of coal now or hereafter in its possession to limit distribution to these essential and urgent uses, as far as practicable and until the conditions warrant a change, the distribution of coal will be limited to the first five classes of the priority list. Retail dealers who distribute coal for household requirements, hotels, buildings, hospitals, etc., should take every precaution to see that coal only is delivered where it is absolutely required and then only in such limited quantities that the supply may be distributed widely and prevent suffering.

The state and other local authorities can materially aid in inspecting and supervising such distribution by retail dealers and the United States government will be glad to leave the supervision and control of such distribution by retail dealers entirely to any state, county or municipality which may make provision therefore. The distribution to the retail dealers must necessarily be administered by the railroad administration in pursuance of the orders already made by the United States Fuel Administration in carrying out the priorities which have been prescribed under the Lever act.

Pig Iron Output Gains Rapidly

November Blast Furnace Statistics Show 35 Stacks Were Relighted During the Month, 30 of Which Were Steel Works Furnaces—Daily Production Shows Increase of 32 Per Cent

PRODUCTION of coke and anthracite pig iron, which was seriously retarded by the recent steel strike, is climbing to its normal output rapidly as shown by the blast furnace figures compiled for November. Although the total tonnage and the average daily tonnage fall below the same figures for August and September, which was a highly productive month in spite of strike disturbances during the last few days, the rapid recovery is marked by the fact that at the close of November 251 stacks were in blast, only 15 less than were in blast on Aug. 31.

AVERAGE DAILY PRODUCTION

	1919	1918	1917	1916	1915
Jan.	106,654	77,523	101,930	102,319	51,323
Feb.	105,270	82,794	94,641	106,157	59,521
March	99,614	103,548	105,026	107,343	66,009
April	82,479	109,112	110,936	107,517	70,484
May	67,991	111,351	110,119	108,535	72,747
June	70,467	110,538	108,675	107,127	78,998
July	78,200	109,954	107,659	103,907	82,687
Aug.	88,453	108,983	104,483	103,156	89,510
Sept.	82,692	113,774	104,691	106,935	94,478
Oct.	60,142	112,335	106,332	113,167	100,656
Nov.	79,377	111,595	106,620	110,593	101,174
Dec.	.....	110,602	93,077	102,715	103,278
Av.	83,758	105,293	104,562	106,610	81,022

The total output in November was 2,381,327 gross tons, a gain of 516,903 tons over the October figure of 1,864,424 tons. Reduced to a daily basis, 79,377 tons was the average per day during November while the previous month averaged only 60,140 tons. The difference is 19,237 tons. The gain of November represents 32 per cent, thus carrying the figure to a safe distance from the October average which was the lowest since February, 1915. With this rate of gain indicated production during the present month should easily pass the September figure and possibly the August total but it is feared that the coal strike may offer complications.

Steel works or nonmerchant stacks produced a total of 1,716,448 tons compared with 1,269,667 tons in October, the gain being 446,781 tons. On a daily basis, the November output shows an average of 57,214 tons per day, 16,257 tons greater than the October average of 40,957 tons. The gain in steel works pig iron capacity amounted to 39.7 per cent and is indicative of the rate at which the steel industry recuperated. Merchant production after better than holding its own during October showed improvement during November. The merchant output was 644,189 tons, an increase of 69,670 tons over October production of 574,519 tons. The average daily output was 21,473 tons compared with 18,533 tons during the previous month. The gain was 2940 tons and amounted to 15.9 per cent.

Active stacks in blast on Nov. 30 numbered 251, a gain of 35 stacks over the 216 in blast on Oct. 31. Again significant of the recuperation of the steel industry is the fact that 30 stacks of the total gain were steel works stacks. Thirty-two stacks of this class were blown in and only two were put out of blast, making a net gain of 30. Of the merchant class, nine stacks were blown in and four were blown out or banked, making a net gain of five.

Spiegeleisen production with 4500 tons shows a loss of 574 tons from the 5074 tons made in October. Ferro production, however, showed an improvement, the November total being 16,190 tons, a gain of 1026 tons over the October figure of 15,164 tons.

Death of H. C. Frick

(*Concluded from Page* 1501)

known of the exact nature of the differences between these two business masters. It appears, however, that they were too unlike in business aims, methods and ideas, to be associates for a great length of time, and reports indicate that Mr. Frick left the company when it was reorganized. Apparently realizing he was in a position to wield considerable financial power, Mr. Frick negotiated to buy out Mr. Carnegie, from whom he obtained a 90-day option. He failed, however, having been unsuccessful in securing the necessary funds to complete the purchase. Mr. Frick later appealed to J. P. Morgan, who with a number of associates finally bought out Mr. Carnegie and merged the Carnegie Steel Co. with the United States Steel Corp.

At the time of Mr. Frick's death, he was a director of the Steel corporation having served in this capacity since the organization of that enterprise. Likewise he was a member of the finance committee, the controlling body of the Steel corporation management.

MONTHLY PRODUCTION

	1919	1918	1917
January	3,306,279	2,403,227	3,159,839
February	2,947,555	2,318,242	2,649,935
March	3,088,023	3,209,996	3,255,813
April	2,474,374	3,273,355	3,328,061
May	2,107,729	3,451,884	3,413,677
June	2,114,028	3,316,148	3,260,234
Total 1st half.	16,037,988	17,972,852	19,067,559
July	2,424,212	3,408,584	3,337,442
August	2,742,081	3,378,479	3,238,970
September	2,480,790	3,413,223	3,140,742
October	1,864,424	3,482,392	3,296,286
November	2,381,327	3,347,844	3,198,597
Total 11 months	27,766,664	35,003,374	35,279,596
December	.....	3,434,114	2,885,380
Total 2d half..	.....	20,464,636	19,097,417
Grand total..	27,766,664	38,437,488	38,164,976

NOVEMBER PIG IRON

States	No. of Stacks	No. in blast last day of month: Nov.	Oct.	Total tonnage made: Merchant	Nonmerchant	Totals: Nov.	Oct.
Pennsylvania	160	112	97	215,818	859,078	1,074,896	959,642
Ohio	79	48	33	97,447	356,075	453,522	257,376
Alabama	45	24	25	111,123	84,073	195,196	209,944
Virginia	19	6	6	22,654	.....	22,654	21,572
New York	28	16	13	66,659	64,278	130,937	96,012
New Jersey	5	1	1	5,000	.....	5,000	5,340
Illinois	25	11	10	23,819	158,396	182,215	87,790
Colorado	6	0	0				
Indiana	16	11	12	42,642	173,224	215,866	130,248
Maryland	4	4	3				
Wisconsin	6	3	3				
Kentucky	7	4	3				
Tennessee	16	5	6	33,667	8,589	42,256	45,023
West Virginia	5	1	1				
Washington	1	0	0				
Georgia	2	0	0				
Texas	1	0	0				
Minnesota	3	3	2	25,360	12,735	38,095	31,239
Michigan	3	2	1				
Missouri	1	0	0				
Spiegel—All states	..	..	..	.....	.....	4,500	5,074
Ferro—All states	..	..	..	.....	.....	16,190	15,164
Totals	432	251	216	644,189	1,716,448	2,381,327	1,864,424

Fuel Rules Foreign Steelmaking

Basic Bessemer Process Generally Employed Because of Cost of Fuel and Lack of Sufficient Amount of Scrap for Open Hearth—Electric Drive Favored Except for Blooming Mills

IN THE accompanying article, which is the third of a series based upon information found in the report of the commission appointed by the British minister of munitions to visit steel works in France, Belgium, Luxemburg and Germany, gives an idea of the present development of the steelmaking and rolling equipment of the iron and steel industry in those countries. The entire report was summarized in the Sept. 18 issue of THE IRON TRADE REVIEW, *following the receipt of the first copy of the report to reach this country. The second article, which analyzed German iron practice appeared in the Oct. 23 issue.*

The most noticeable difference between steel practice in the districts visited by the commission and that in the United States, is in the melting process employed. In Europe most of the plants are of the basic Bessemer type, while in this country the open-hearth furnace predominates. Although steelmakers claim that with the ore available and under the conditions existing in Europe, the basic Bessemer process is preferable, still a slight tendency to adopt the open-hearth was noticeable during the war. The fact that the steel output of Germany and England exceeded the production of pig iron in those countries in 1914 and 1916, respectively, a development which took place in the United States as early as 1911, indicates that there is a tendency to use more scrap and that open-hearth is used more extensively than before. Germany, it is pointed out, may adopt the open hearth process more generally.

The rolling mills in the districts visited seem to be well laid out and equipped with modern machinery. In most cases the electric drive seems to be used for roughing and finishing mill rolls but in only a few cases have electric motors been applied to blooming mills.

THAT the basic bessemer process of steelmaking predominates in Europe is clearly indicated by the fact that of the more than 200 steel furnaces in plants visited, 123 were basic-lined bessemer convertors. Of the remainder, 67 were basic-lined open hearths, three were acid-lined open hearths and about a dozen were electric furnaces. In the Lorraine and Saar valley districts, the ratio of converters to open-hearth furnaces was 54 to 25, while in the Cologne district of Germany only 10 bessemer units were mentioned as compared with 23 open hearths. In Luxemburg, including Longwy, 30 converters and 10 open hearths were noted. Almost the same relation existed in Belgium where the count was 28 bessemer and 12 open-hearth furnaces.

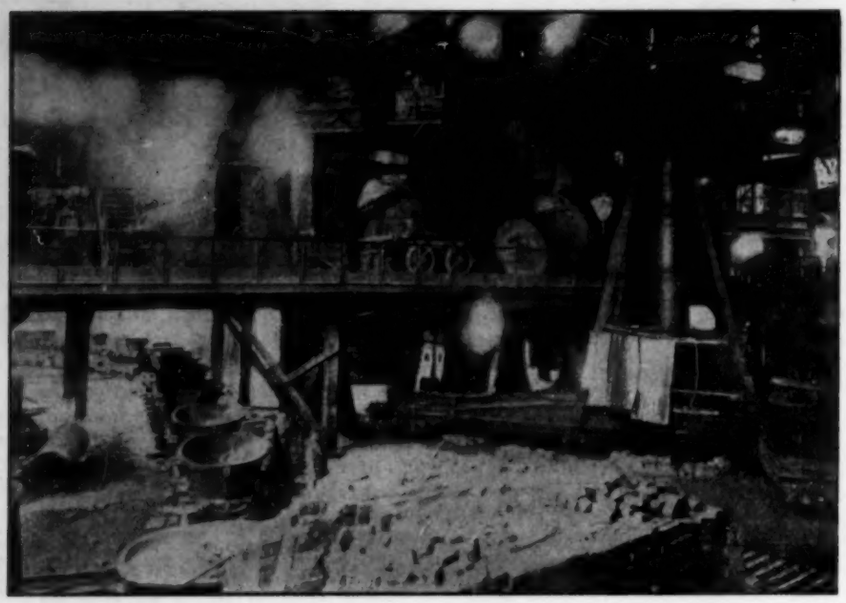
From this information it is evident that in the Lorraine, Luxemburg and Belgium districts, the basic bessemer process is firmly intrenched, but that in the limited area visited in Germany, the open hearth seems to find favor. In one of the plants near Cologne, four 80-ton tilting basic open hearth units were installed during the war. This, coupled with the fact that the only acid furnaces noticed by the commission were in this district, gives rise to the question as to whether or not Germany is on the verge of more generally adopting the open hearth process. It will be remembered that soon after bessemer practice began to decline in America, the annual output of steel increased and in five years passed the output of pig iron. In Germany, this change took place in 1914, as shown in the chart appearing elsewhere in this article.

Several reasons are advanced by European steelmakers for the large proportion of bessemer converters employed. It is pointed out that with the present practice in Lorraine, the average number of blows per 12-hour shift is 30 whereas the normal number of heats from an open hearth is three or four per day of 24 hours. The high cost of producer gas and the absence of scrap are factors which also influence steelmakers in their choice of methods.

Where open hearth steel furnaces are installed they work with charges containing 75 to 80 per cent of scrap and 25 to 20 per cent of pig iron. Moreover, they attempt to get three or four, and even five tappings per 24 hours, all of which conditions, compare favorably with the average English practice.

The bessemer plant at the Burbach Steel works, near Saarbucken, is typical of those in the Lorraine-Saar valley district. The equipment consists of three 150-ton mixers and five 25-ton converters. At the present time these units are being operated

GUIDE MILL WHICH IS TYPICAL OF LUXEMBURG PRACTICE. THE ROUGHING TRAIN CONSISTS OF FOUR STANDS OF ROLLS AND THE FINISHING TRAIN NINE STANDS OF ROLLS



BESSEMER DEPARTMENT IN A LARGE BELGIAN STEEL PLANT. TRANSFER LADLE CRANE IS OPERATED HYDRAULICALLY

slowly, 30 minutes being taken for the fore blow and 1½ minutes for the after blow. A tar-fired furnace and a 5-ton electric furnace are employed for melting ferromanganese. The converters are blown by a 4200-horsepower Nurnberg engine capable of blowing up to three atmospheres per square inch.

Use Anthracite in Ladle

With the object of saving as much ferromanganese as possible during the war, about 50 pounds of anthracite was added to the steel ladle after the bottom had been covered with steel. After reaction had subsided and the metal deoxidized the manganese was added. It is stated that 18 per cent of ferromanganese was saved by this expedient. At the present time a mixture of ferromanganese and spiegel is used, the mixture containing about 20 per cent of manganese.

At the Adolf Emil Hutte works, Esch-Beles, Luxemburg, the following reasons were given for the preference of the basic bessemer prices in continental Europe: First, the amount of gas required in open-hearth furnaces necessitates larger quantities of coal being transported long distances by rail; second, the number of men per ton of steel made is greater; and third, the Lorraine ore is sufficiently high in phosphorus to furnish the necessary heat in blowing and to yield a marketable slag for fertilizing purposes.

In one German works visited by the commission all of the steel was being made in fixed open-hearth furnaces. The equipment of this plant consists of three 15-ton acid-lined units; and one 50-ton, four 40-ton, one 30-ton and three 15-ton basic furnaces. The pig iron comes from furnaces at Wissen, on the Sieg, and contains about 1 per cent of manganese and from 0.2 to 0.3 per cent of phosphorus. The charge for the larger furnace consists of 70 per cent scrap, 25 per cent pig iron and 5 per cent iron containing from 2 to 6 per cent manganese. The number of charges per furnace in a week of six full working days varies between 20 and 24. Two men are employed on the charging side and one man on the tapping side of each pair of furnaces.

Open Hearth Used for H. E. Shell Steel

According to the report of the commission, there is but little doubt that nearly all of the high explosive shell steel was made in open-hearth furnaces and that basic bessemer steel was rolled down for sections, light rails, wire rods, reinforcement bars and other materials used in the field. It was said that the Burbach plant was the only one in which satisfactory steel rounds for high explosive shells were made from basic bessemer steel without a heavy percentage of rejections. At Volklingen in the Saar valley three small basic open-hearth furnaces were erected during the war for the express purpose of making high explosive shell steel. About 1000 tons per week were produced.

It is possible that the wartime use of the open hearth process may exert some influence in the selection of steelmaking units for new plants. The extensions contemplated at the steel works at Rombas, France, include one 1200-ton and one 500-ton mixer, six 30-ton converters and four 60-ton tilting open-hearth furnaces. Another new open hearth melting plant is under construction at Neunkirchen near Saarbrucken. The three 35-ton furnaces in this works are now nearing completion. They were specially designed by the works engineers and will be operated on gas from nine Poetter-type producers.

Electric Furnaces Built During War

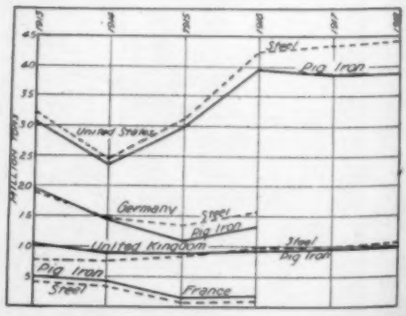
Comparatively few electric furnaces were noticed by the commission in comparison with other types. In several instances, electric units were installed during the war for the purpose of making steel for high explosive shells. One of these, a 12-ton furnace at Neunkirchen, averaged 60 tons per 24 hours and during 1918 produced about 15,000 tons of this material. Molten converter steel was charged in this furnace.

The electric steel equipment at the Thyssen works, Hagondange, Lorraine, in addition to a small unit for

Steel Output Overtakes

ACCORDING to the accompanying chart, which was plotted from the figures shown in the table the steel output overtook and passed the output of pig iron in Germany in 1914. In 1916 the same change took place in England, while in France during a four-year period the production of pig iron exceeded that of steel by a fairly uniform margin.

These comparisons are interesting in that the changes which took place in Germany in 1914 and the United Kingdom in 1916 correspond to the experience of the American steel industry in 1911, when the annual steel output first surpassed that of pig iron. It is quite probable that the rapid development of the open-hearth furnace, with the accompanying increased use of scrap, caused the change to occur earlier in the United States than in Europe.



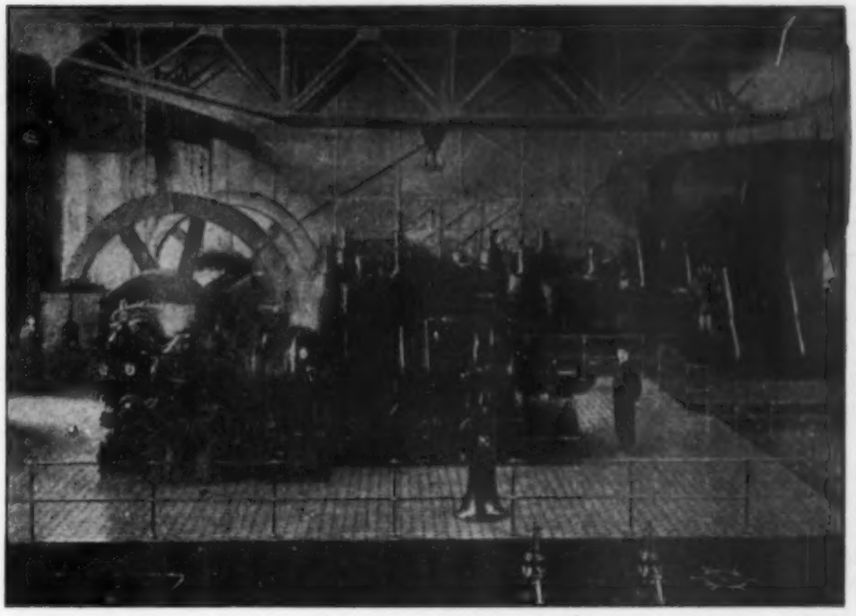
COMPARISON OF IRON AND STEEL OUPUT

melting ferromanganese, consists of one 10-ton and one 15-ton heroult furnace. The large furnace is arranged to handle metal from either the converter or open-hearth plants, a plan similar to that employed by the Illinois Steel Co. at South Chicago. The time of working the charge was said to be 90 minutes with a current consumption of 200 units per ton.

Crucible Process Discontinued

Indications point to the fact that in the districts visited, electric furnaces are fast superseding crucible furnaces in the manufacture of tool steel. At the plant of the Arbed company, Dommeldange, Luxemburg, basic pig iron is first melted in two open hearth tilting furnaces of the Wellman-type and the metal is transferred to four 3½-ton Rochling-Rodenhauser electric furnaces. Special steels are made for castings and for ingots, which afterwards are forged to various sizes of tool steel.

The Stahlwerk Becker Co., Willich, Germany, specialists in making alloy, high quality carbon steel, high-speed tools, ball bearings and thin armor plate has discontinued the manufacture of crucible steel and now is employing the electric furnace. Most of the ingots are group cast from the bottom, but for the best steels top casting is adopted, the molds having the wide end up and a "dozzle" being introduced when the mold is nearly full. These molds are circular in section and the skins of all the ingots are turned off in lathes before rolling or forging. Most of the ingots weigh about 200 pounds.



COMPOUND, GAS-DRIVEN BLOWING ENGINES WHICH SUPPLY THE AIR FOR THE BLAST FURNACES AT A LARGE BELGIAN PLANT

Rolling Mills Well Arranged

According to the report, the layout and equipment in nearly all the steel works are excellent. Many useful devices were seen and some of the mills are very economical and give large outputs. Electrical cranes and labor saving devices are employed wherever possible.

Duplicate mills have been installed in many plants to insure that time is not lost while changing rolls. Some cogging mills are provided with duplicate drive, to preserve the continuity of work in case of one engine breaks down at any time, and also to secure regularity of output in the bessemer shop, where there are many unheated soaking pits, which are only suitable for a continuous and regular flow of hot ingots from the bessemer shop to the blooming mills.

Those rolling mills which are steam driven are nearly all equipped with reversing and continuous running compound engines, and the most modern reversing engines are three crank.

The mechanical appliances for handling the piece at the cogging mill were practically identical at all works and consist of long heavy moving guides operated simultaneously on both sides of the rolls, each guide being kept in alignment with its fellow guide on the opposite side of the mill. On the side nearest the soaking pits one guide is provided with tilting fingers for turning the bloom over. The advantage of this arrangement over the ordinary type of manipulator found in England is that the bloom is kept straight the whole time during rolling, the guides being worked so close to the piece that bending towards the cooler side in the case of an ingot unevenly heated is impossible. As a result, cogging is performed rapidly while the piece is at a good heat, with a corresponding reduction in the power required per ton of output. A similar manipulator has just been built by Davy Bros., Sheffield, for a new cogging mill in the north of England, and will be the first of its type to be used in the United Kingdom.

Cranes Used Extensively

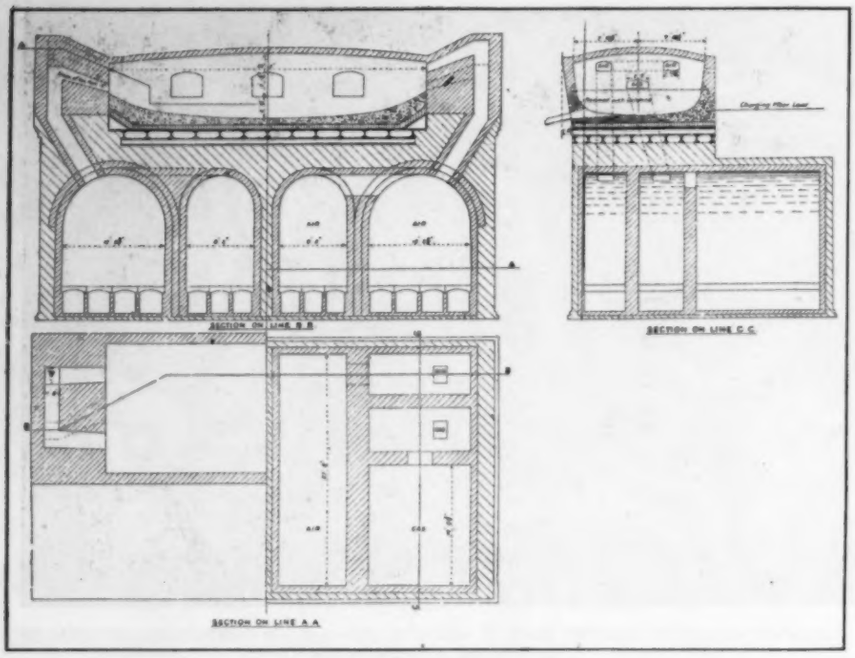
The mill housings are of heavy construction and modern appliances are installed for satisfactory economical finishing of products, including modified Morgan hot banks, straightening, sawing and shearing machines. Overhead cranes are provided over hot banks, and extend out over the covered stock yard and open stock yard beyond, so as to obviate unnecessary handling. This reduces handling costs.

Lead Held by Pig Iron

PRODUCTION OF PIG IRON AND STEEL

Year		Pig Iron	Steel
1913	United States	30,966,152	32,321,618
	United Kingdom	10,260,315	7,663,876
	Germany	19,291,920	18,958,819
	France	5,207,197	4,686,866
1914	United States	23,322,244	24,206,276
	United Kingdom	8,923,733	7,835,113
	Germany	14,391,611	14,973,106
	France	4,500,000	3,250,000
1915	United States	29,916,213	32,151,036
	United Kingdom	8,793,659	8,550,015
	Germany	11,789,931	13,258,054
	France	1,300,000	870,000
1916	United States	39,434,797	42,773,680
	United Kingdom	9,047,983	9,196,457
	Germany	13,259,000	16,035,000
	France	1,400,000	1,000,000
1917	United States	38,647,397	43,500,000
	United Kingdom	9,420,254	9,804,079
1918	United States	38,500,000	44,000,000
	United Kingdom	9,782,525	10,411,801

In Lorraine, Belgium, Luxemburg and Germany basic bessemer furnaces are used more extensively than open-hearth units because of the high cost of imported fuel and the absence of scrap iron and steel. Where basic open-hearth furnaces have been installed, the output is small compared with that of the basic converters and the works depend largely upon local mill scrap for the necessary charges. In Germany, however, open-hearth plants were more in evidence. The commission reports that open hearth steel seemed to be used for high explosive shell steel because rejections were excessive when the rounds were made from bessemer metal.



SECTIONAL VIEW OF A TYPICAL OPEN-HEARTH FURNACE IN THE SAAR VALLEY

In most of the mills which have been installed recently the electric drives having been provided for practically all of the roughing and finishing mills. Where this practice is followed, it is customary to run one or a number of turbo generators parallel with the gas engines for generalization of power on account of the great flexibility of the turbine and its capacity for taking varying peak loads more readily. At Hagondange 36.45 per cent of the total generating capacity is by turbo-generator which, according to the report, is a fact tending to confirm the opinion expressed at other works visited, that electric drive for large reversing mills, particularly blooming mills, is not as economical in practice as in theory.

Steam engines were seldom seen except in connection with blooming and heavy section mills. Wherever they are used, however, surplus blast furnace gas is generally utilized to generate the steam in the boilers which are installed in connection with these rolling mill engines. In a few cases hand-fired Lancashire boilers were seen.

The larger part of the production of mills in the Lorraine and Saar valley districts consists of ordinary merchant steel sold without guarantee or test. The production includes plates, sheets, light and heavy rails, steel sleepers, hoops, wire rods, joists, channels, tees, angles, flats, bars, etc. The number of plate mills is comparatively small. A new tin plate mill under construction at Dillingen was all but completed at the time of the commission's visit. All the material is cold straightened before being placed in stock, no extra charge being made for this service. Apparently the steel works execute from stock a large number of orders which they receive, by this means insuring prompt delivery to their customers and eliminating the merchant. Acting as their own warehousemen they can readily execute orders for any number or size, presumably securing the merchant's profit for themselves.

It is pointed out that in England steel making and stock hold are separate branches of the business but that in Lorraine especially they are carried on by the same concern and judging from the large stock held the combination appears to be regarded as profitable.

Nearly every place visited has a slag brick works. The bricks are made in machine presses, each press producing about 10,000 ordinary bricks per day. The slag is granulated by being run while molten into water. About 5 per cent of lime is added to this granulated slag to act as a binder, and the mixture remains for 24 hours before being pressed. After pressing the bricks are simply air-dried. They are in large demand in the district for building purposes. Before the war the sale price at the works was about 18 to 20 marks per 1000; while today it is 60 to 65 francs per 1000. Some of the steel works have a slag cement works attached.

Hints on Packing

Manufacturers and exporters to the Near East will be interested in the following remarks submitted by Major Kennard, the Federation of British Industries commissioner for the Near East, in connection with the packing of goods exported to that district.

There are always a certain number of tin plates to the box according to size and weight of sheets ordered. These boxes are invariably thin. Owing to the weight of the contents

Operating Costs Soar in Germany

PRODUCTION AND COSTS OF STEEL AND FINISHED MATERIAL

THE ADOLF EMIL WORKS OF THE GELSENKIRCHENER BERGWERKS-AKTIEN-GESELLSCHAFT AT ESCH-BELLES IN LUXEMBURG

(Figures taken by the Commission from the Company's Cost Books)

Steelworks

(Conversion of Pig Iron to Steel)

	1913 Average per month	1918 Average of June and August
Production	30,060 tons	31,084 tons
	Kilograms	Kilograms
Materials used per ton of ingots:—		
Luxemburg pig	1107	1073
Spiegel	2	7
Ferromanganese	5	7
Steel scrap	10	57
Total	1124	1144
Less scrap recovered	6	4
Net total of metals	1118	1140
Coke	6	
Coal	3	
	Marks per ton	Marks per ton
Costs:		
Wages	1.19	2.64
Material	0.21	1.64
Spare parts (molds), etc.)	0.66	1.89
Repairs, etc.	0.12	0.45
Electricity, etc.	0.37	1.22
Overhead charges	0.77	1.50
Refractories:		
(a) acid	0.21	0.66
(b) basic	0.46	1.15
Laboratory	0.10	0.34
Lime	2.14	5.90
Gas and water	0.07	1.50
Total	6.43	18.89

Rolling Mills

(Conversion of Ingots to Rolled Sections)

	1913 Average per month	1918 Average of June and August
Production	24,581 tons	24,944 tons
	Kilograms per ton	Kilograms per ton
Consumption of ingots per ton of rolled section	1208	1248
Waste produced for scrap	165	186
Net	1043	1062
Consumption of coal and coke	17	18
	Marks per ton	Marks per ton
Costs (Mks. per ton of finished material)—		
Finishing after rolling	3.03	8.31
Roll turning—		
(a) Replacement	0.29	0.42
(b) New rolls	0.04	0.09
Consumption of rolls owing to wear, breakages, etc.—		
(a) Replacement	0.31	1.77
(b) New rolls	0.01	....
Wages and salaries	1.87	5.01
Materials (lubricants, etc.)	0.67	4.39
Spare parts	0.81	0.68
Repairs	0.37	0.93
Electricity, etc.	0.90	2.84
Administrative charges	1.08	2.25
Overhead charges	0.83	1.57
Alterations and extensions to plant	0.22	....
Gas and water	0.23	0.36
Total	10.66	28.62

there are always a certain number of tin plates to the box according to size and weight of sheets ordered. These boxes are invariably thin. Owing to the weight of the contents

they usually arrive broken, and it is not unusual for them to be discharged loose, which leads to damage often and to pilfering invariably. It cannot be too strongly recommended that these boxes be iron-hooped. The extra charge for iron-hooping should be quoted originally and charged on invoice, or, better still, should invariably be allowed for when c.i.f. price is quoted.

The usual packing of bedsteads by British makers is satisfactory. It is most important, however, to note that all brass parts should be removed from the bedsteads and packed in separate cases, for if the brass parts are attached to the beds, entry dues (which are governed by weight) are charged on the full weight of the bedsteads at the full rate for brass, which is much higher than that for iron. Thus a saving is effected in handling quantities of these goods.

Workmen Demanding Self-Expression

BY CYRUS McCORMICK JR.

IT HAS been suggested that the difficulties under which employers and employes are operating are due to the nervous tension resulting from the war; to the high cost of living; to the fear of unemployment; to insufficient wages; to desire to share in the profits of industry; to a revolt against the old order of things whatever that may have been, etc. Each critic has, however, been more or less in agreement that the war taught nations once and for all time that individual workmen must be regarded as human beings.

In agreement with many critics of the present industrial situation, I believe that the most significant feature in labor conditions of the day is the expressed desire of labor to share in the management of business. This desire has taken on various forms in different parts of the world. In Russia we see it as Bolshevism, which is nothing more or less than a practical application of the doctrines put forth some years ago by the I. W. W. in this country.

It has been said that 65 per cent of the strikes which have taken place in Central Europe since the war are of purely syndicalist origin. In this country we have had demand after demand cataloged generally under the term of "better conditions." In England we have seen a complete disruption of industry from which has grown up the so-called Whitley plan and, more recently, the ever-widening clamor for nationalization of industry.

The underlying significance of all these movements is the final realization that the relations of employers and employes must from now on be formed on something besides a cash basis. The workman is as interested as ever in his wages and in his hours, but he is asking for more. Sometimes the demands are not well understood even by those putting them forward. What the workman really wants is self-expression. They are asking the right to discuss and adjust matters affecting their own interests.

Many employers in this country, sensing this situation, are admitting the right of their employes to discuss in joint conference, matters affecting the mutual interests of capital and labor. This, of course, has involved a recognition of the principle of collective bargaining. Economists of the older school tell us that collective bargaining is detrimental to the best interests of the employes and that any artificial interference with wages will result in an artificial attempt to regulate prices. They claim that values are regulated by economic laws. This, of course, is true to a certain extent, but on the other hand it can be argued that collective bargaining is an aid to humanity and that it allows other economic laws to operate which might otherwise be held in abeyance.

Favor Collective Bargaining

Not many years ago the doctrine of *caveat emptor* ruled every economic transaction and the business world was permeated with the ethics of David Harum. Just as that doctrine has vanished, so now is vanishing the fear of collective bargaining, and we find ourselves not only admitting the right of workmen to participate in the determination of working conditions but also discussing how this right may be most surely exercised. The method finding most favor in this country can perhaps best be classified by simply calling it employe representation.

There appear to be four main reasons why employers are seriously considering the adoption of employe representation.

Syndicalism has made such rapid strides in eastern Europe that some men, not recognizing the fundamental solidarity of the American people are afraid that this country is about to deliver itself to bolshevism; therefore they are seeking to head off this unrestrained development and to provide a saner method by which the legitimate desires of the workmen for self-expression may be granted without at the same time completely ruining our present industrial fabric.

There is a close parallel existing between the movement in favor of employe representation and the growth of democratic government.

It is easy to point a finger of scorn at our present civilization and condemn it as being overly materialistic. Metaphysicians from Aristotle to the present day have argued against materialism. Phrasing their thoughts in the vernacular and adapting their theories to modern times we may say that we must find some new cause for our existence beside the worship of the almighty dollar. The joy of doing things rightly will in the end give men a more real satisfaction than the material results of their efforts. Applying metaphysics to employe representation, we may describe it as a concrete effort to introduce moral right into industry.

Looked at superficially, employe representation is expensive. It costs a certain amount of money to pay the added salaries, to do the clerical work involved, and the like; but those employers who have had the best experience say that it is really economical and efficient. They believe it pays; they believe the added interest a man must have in his work when he knows he has a share in the control of it, will go a great way toward bringing about the final efficiency of production which must be secured if the present pace of manufacturing is to be maintained. Scientific management has just one more step to take. It must become endowed with soul in order to become more efficient; and its savings must depend not upon force or will, but upon the consent of the governed. The war has proven that democratic society, while superficially less efficient than autocracy, is in the end far stronger in the face of the most awful competition human ingenuity can devise.

From a paper presented at the eighth annual congress of the National Safety council, Cleveland, Oct. 1. The author, Cyrus McCormick Jr., is works manager of the International Harvester Co., Chicago.

Applying Depreciation Equitably

Depreciation is Operating Expense Which Must be Systematically Handled in Accordance With Preconceived Plan—Present High Costs May Affect Rates on New Industrial Buildings and Equipment

BY D. C. LOWLES

PROBABLY no subject within the limits of modern accounting practice is worthy of more study and capable or more contradictory interpretations than that of depreciation. No item of costs has received greater attention than has this in the last few years and upon no item has there been placed so many varying values.

In general, the items of capital upon which depreciation should be figured can be grouped under three headings: *First,* plant of permanent character including land and buildings, with the usual engineering and legal charges incidental to construction and title; *second,* equipment of all kinds, machinery, tools, appliances, furniture, autos, etc., necessary to production or to business operation; and *third,* capitalized general expenditures such as those for legal expenses, patents, development, plans and processes, that have a continuing value considerably beyond the fiscal period in which they were incurred.

All of these items decline in value as time goes on due to the operation of various causes and it is extremely important therefore that proper provision be made in the operating accounts for such value losses and that all costs properly include a fair proportion of these "value" expenditures.

Is an Operating Expense

Authorities on accounting are very emphatic in maintaining that depreciation is an operating expense. One accounting expert, commenting on this phase of the problem, declares that often statements in published reports show that a corporation has realized net profits amounting to a certain sum, and that out of these profits an allowance for depreciation has been made. It would be just as logical to state that a pig iron manufacturer had earned a net profit of $100,000 and that out of the $100,000 there had been set aside $20,000 to pay for the ore consumed in the manufacture of the product.

It is obvious that the profit or loss of an undertaking for any period cannot be simply the difference between the receipts and expenditures for that period, neither can it be assumed that the current value of plant and equipment will be always equal to the amount expended upon. Depreciation must be considered. There are times of course when entirely extraneous influences may cause fluctuation in the value of fixed assets, but as the actual manufacturing or trading profits are not affected thereby, either way, these fluctuations need not be considered in this connection. Depreciation is altogether distinct from fluctuation and is due to the possession and use of the assets and is therefore part of the cost of operation.

Elements of Depreciation

The principal elements of depreciation follow:

1. Wear and tear due to and varying with the use of the building or equipment. Part of this may be offset by repairs, renewals, etc., but there will always be eventually a diminished efficiency with a consequent decline in value.

2. Physical decay from exposure to the elements, rust or other causes and due often to lack of use or neglect of maintenance and repairs.

3. Accident, usually a very sudden depreciation, in many cases entailing expenditures materially in excess of maintenance and sometimes producing a permanent value loss.

4. Obsolescence caused by improvements in machines and methods necessitating substitution of the plant or equipment with new in order to keep abreast of the times and meet competition.

5. Inadequacy, somewhat allied to obsolescence but due rather to enlargement of business, and increased output, or in the case of motor trucks, freight cars to an increased load requirement.

It is said that obsolescence cannot be foreseen and that any attempt to reduce the contingency to a definite allowance to form part of current costs would defeat its own purpose. A reserve should be created to meet the possibility, but the reserve should be provided for out of profits before stating the surplus applicable to dividends and never as an item of prime cost.

The factors governing the determination of the amount of depreciation include:

1. The cost of asset, whether building, machine, or other item. This may be either the actual cost price or in the case of a transfer of a business or group of assets, its estimated value.

2. Its estimated life, regard being had to its functions and the conditions under which they are performed.

3. The extent and value of repairs and renewals made from time to time.

4. Its value in use or its present earning power, relatively and comparatively, to other like assets used for similar purposes.

5. Its residual value, either as scrap or as an article which, though possibly applicable to other uses, is no longer fit for its original purpose.

Depreciation may be classified as unit depreciation, relating to individual machines, buildings, motor trucks or other units of plant; group depreciation, covering groups of like units such as office furniture, machines of various kinds in one or more groups, permanent tools, trucks, etc.; and composite depreciation which is the resultant effect upon the whole plant of unit or group depreciation. The total depreciation of the plant is therefore the composite depreciation, equal to the sum of the detailed depreciation amounts.

Methods of Applying Depreciation

Absolute accuracy in the determination of depreciation is impossible. The past effects of wear and tear, physical decay, obsolescence and inadequacy can be determined with reasonable accuracy, while the future effects of wear and tear and decay may also be estimated from experience satisfactorily close, and even inadequacy may oftentimes be foreseen, but obsolescence can only be predicted with much uncertainty. Yet given a sufficiently comprehensive grouping of large numbers of plant items the law of averages will apply and it will therefore be possible to establish a reasonable ratio of decline in value.

The methods used in applying depreciation have varied considerabdy, probably the simplest and most easily applied being what is known as the straight line method. This is free from interest or other complications and is simply the application of a standard percentage rate per year to the original or book cost.

A method often used though less frequently is the reducing balance method by which a certain percentage deduction is made from the original cost, each year's percentage being applied to the balance remaining after the previous depreciation amount has been deducted. It is apparent that by this method the asset is never entirely depreciated.

The sinking fund method, which provides for setting aside annual sums of money that will accumulate at compound interest to a certain sum in a given time, is not often used in ordinary business because of the complications involved in the necessary calculations and be-

From a paper presented before a recent meeting of the accounting manager's group, Cleveland chamber of commerce. The author, D. C. Lowles, is auditor, Cleveland Metal Products Co., Cleveland.

cause any kind of a sinking fund is rarely advisable owing to the greater earning power of capital used in the business.

A fourth method and one coming more generally into use for certain classes of equipment is called the unit of production method, by which a certain amount of depreciation is charged off according to the output produced or in the case of autos and trucks according to the miles run or the tonnage carried. Some machines are good for a limited output only and this being known, it is a simple matter to apply the correct depreciation to the product.

There are other methods of depreciation used such as the periodical appraisal, which is good only if the appraisal can be relied upon and if basic values do not fluctuate from one appraisal to another, and the hit and miss method with which all are familiar and which is still in use by many.

Showing Depreciation on the Balance Sheet

Depreciation is usually taken up on the balance sheet by reducing the asset value to show in one figure the net remainder, or by showing the reserve for depreciation as a liability and the asset at full value, or by showing on the asset side, first the full value, then the depreciation deducted as a separate item, with the net asset extended.

All three methods are correct under certain conditions. For all practical purposes it is not necessary to separate the depreciation reserve and where it relates to plant and equipment it is therefore preferably shown by the third method which is standard American practice.

It is when we come to ratio of depreciation that the experts disagree, and this is only natural since every business of industry has its own peculiarities. Even buildings of the same type depreciate differently if used for different purposes and sometimes the rate varies when used for the same purpose but in widely separated localities. Then again land may depreciate rapidly in one place and appreciate in another. Machinery if of standard design and make and readily adaptable to more than one industry has a lower depreciation and a higher second-hand selling value than machinery specially designed for a particular process in one industry and not saleable at all except for scrap. An automobile that is well advertised and made by a large company has a higher second hand value and therefore a lower depreciation rate than an "orphan" or one made by a small company and not well known.

Another factor governing depreciation rates that is of particular importance at this time is that of excess or abnormal costs. It is a question whether a double rate would not be justified in the case of a building for instance which due to abnormal conditions cost far in excess of a reasonable amount. By this I mean the use of a higher rate of depreciation for the first five or 10 years with a normal rate after that time.

Obviously no general rate will apply to buildings as methods of construction, the materials used, the use to which it is to be put, etc., all affect the result. The bureau of internal revenue suggests that the average usable lifetime of a frame building is 25 years, a brick building 35 years, and a stone or steel and concrete building 50 to 100 years. Very few accountants feel safe in adhering strictly to rates based on such averages. While 35 years is a reasonable life for a first class brick building, 25 years seems too long for the average frame structure used for manufacturing purposes, and to project one's imagination 100 years as the estimated life of a steel and concrete building is a difficult task. Generally rates should run on frame buildings about 5 per cent, on brick 3 per cent or where unusual strain or vibration is present not less than 4 per cent, and on the highest type of concrete and steel construction 1½ per cent to 2 per cent.

Equipment varies so materially that no general rate can apply. In the case of machinery for instance so many factors enter into the problem that it seems almost necessary for each machine to carry its own individual rate. The setting of the machine, the solidity of its foundation, the expenditures upon repairs and renewals, the degree of cleanliness and lubrication and the skill of the operator all affect its life and final value. Yet it is not practical, except for very large machines operated as an independent unit, to maintain detailed records and to figure separate depreciation. A grouping for each industry of machines of like kinds and approximately equal life will give entirely satisfactory results.

The rates shown in the accompanying table are indicative only of individual opinion and are subject to all of the variations so far mentioned, and are taken from various authorities. The list obviously is very incomplete, but the individual experience of each manufacturer will readily supply additional information.

Average Rates of Depreciation

	Per cent
Engine, turbines, etc.	3 to 8
Boilers and auxillaries	3 to 10
Generators	5 to 8
Electrical wiring and cables	4 to 8
Switchboards and instruments	5 to 7
Motors	4 to 8
Piping, steam and water	5 to 7
Light machinery, fast running	7 to 10
Heavy slow moving machinery	5 to 8
Machinery subjected to heavy use, vibration, etc.	10 to 12½
Special machinery for particular processes	10 to 25
Miscellaneous shop appliances and equipment	7 to 10
Dies and special tools. (Depending upon the plan followed in charging additional items to this account.)	10 to 20
Furnaces (If all repairs and renewals are charged to operation.)	8 to 15
Motor trucks (Or preferably on a mileage basis as used.)	15 to 25
Automobiles	15 to 25
Wagons	8 to 10
Office machinery, including typewriters, adding machines, etc.	at least 20
Office furniture and fixtures. (Or in some cases it is wise to follow the practice of financial institutions and charge all office furniture and equipment to current operation.)	at least 10

Book Review

Development of Iron Ore Into Iron and Steel, by S. C. Dickerhoff Jr.; heavy paper, 15 x 25 inches, price $1, postpaid; blue print, 30 x 50 inches, price $1.50, postpaid; for sale by THE IRON TRADE REVIEW.

This is an excellent chart which graphically describes the steps in the manufacture of various grades of steel. The author begins with the blast furnace and distributes the product, pig iron, to the open-hearth furnace, the bessemer converter; the electric, puddling and air furnaces; and, the cupola. At this point he discusses the various grades of steel made by each melting process and then outlines the channels into which each particular grade of steel passes for the manufacture of marketable products.

The chart includes a glossary and general notes on pig iron and steel, the latter of which deals with malleable and wrought iron; simple, weld, alloy, ternary, complex, raw, natural, normalized, annealed, hardened, tempered, soft-centered, blister, cold-rolled and high-silicon steels. Under bessemer, electric, open-hearth and crucible steels the numerous products into which these grades of steel are made, are given, followed by practical notes on the individual processes of manufacture. A box in the right-hand corner of the chart includes typical analyses of iron ore, pig iron, wrought iron, billets and sheet bars, tool steel, rails, steel castings, boiler plate and rivet steel, and structural steel for buildings.

Wire is tinned by a process similar to that of hot galvanizing. A method commonly used for preparing wire for tinning is to draw the product with a copper coating, which is made by dissolving blue vitriol in water with a small percentage of free acid. This effects a greater adhesion of the tin.

Studying Strains in Rolling Steel

Economy is Gained by Using Strip as Wide as Possible Consistent With Dimensions of Rolls, Power of Mill and Degree of Uniformity Desired in Thickness of Product

BY ALFRED MUSSO

WHEN a piece of metal is put through the rolls in a rolling mill, its linear dimensions are strained and the whole piece itself is deformed. In other words, the thickness of the piece becomes smaller while its length and width are increased.

Let $ABCD$ in Fig. 1 be the cross-section of a piece of metal as subjected to the pressures P and P_1 normal to the faces shown in cross-section as AB and CD. When the compression is carried beyond the elastic limit of the material, the two faces AB and CD will come closer together as shown by the dotted lines A_1B_1 and C_1D_1, while the two side faces AO and BD will bulge outward as shown by the dotted curved lines A_1C_1 and B_1D_1, and if the forces P and P_1 are still increased the piece ultimately will fail by shearing along its diagonals.

The ultimate behavior of the failing piece is influenced by the structure of the metal itself. In fact, experience shows that ductile metals possessing a homogeneous structure, such as copper, aluminum, etc., will become plastic and flatten down to a disk, while fibrous metals, such as steel, wrought iron, etc., where strength across the grain is much lower than with the grain, are not susceptible of any plastic state at all and will ultimately fail by splitting sideways. However, it is sufficient to regard the piece as shown by Fig. 1 as divided into six pyramids having as a common vertex its pressure center O, and as bases its six faces.

It is obvious that while the compressive forces P and P_1 are tending to telescope into each other along the pressure line PP_1 of the upper and the lower pyramids, the other four pyramids will be pushed outside by the expulsive forces R_1 and R_2 consequentiy set up by the aforesaid pressures P and P_1. The value of the expulsive forces evidently depends on the two angles AOB and AOC, ordinarily known as the *pressure angle* and the *expulsion angle*, respectively. We will now apply the foregoing considerations to the rolling-mill process, and begin our investigation of the effects of the roll pressure at any point of the surface of the piece.

Fig. 2 represents a cross-section of a

Presented at the annual meeting of the American Society of Mechanical Engineers, New York, Dec. 2-5. The author, Alfred Musso, is general manager, the Coast Cooling & Engineering Co., New York.

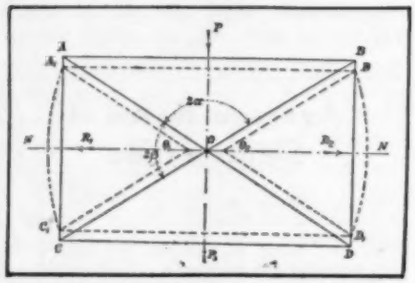


FIG. 1—CROSS-SECTION OF A PIECE OF METAL SUBJECTER TO PRESSURES P AND P

rolling mill through the rolls. NN_1 is the piece of metal going through the rolls C and C_1. Inasmuch as the pressure is exerted radially, it may be considered at any point, say at A, which is the initial point of the contact arc AMB. The pressure P may be resolved into two components, one normal to the piece and the other parallel to its surface, thus $n = P \cos \phi$, normal component and $a = P \sin \phi$, parallel component, ϕ representing the angle ACB, known as the *approach angle*. The directions of the components clearly show that while n is the force which actually compresses the piece, a is the component of the pressure which hinders the piece from entering the rolls, and unless n is larger than a, the rolls will not grip the piece.

The useful limit of ϕ is easily found. The force n is greater than a, and $P \cos \phi$ is greater than $P \sin \phi$. Eliminating P, $\cos \phi$ is greater than $\sin \phi$, and therefore ϕ is less than 45 degrees. The actual value of ϕ for metals is given by $\tan \phi = m$, the coefficient of friction between roll and piece, but for metals m equals approximately 0.577; therefore, ϕ equals $\tan^{-1} 0.577$ or 30 degrees, which according to actual practice is the maximum value of the approach angle for which the rolls will grip the piece.

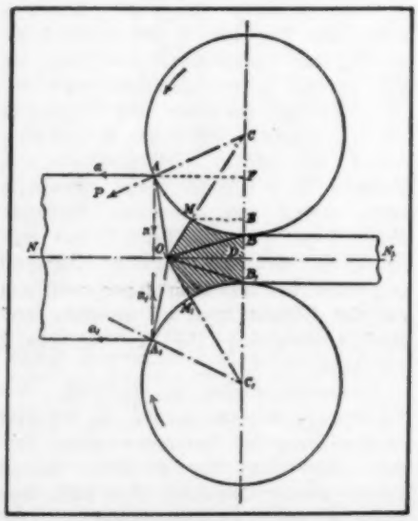


FIG. 2—CROSS-SECTION OF A ROLLING MILL THROUGH THE ROLLS

Let us now deal with the effect of the pressure on the whole arc of contact AB. We may consider the pressure as applied to the middle joint M and the whole piece represented in cross-section by ABB_1A_1 will be divided into pressure pyramids with a common vertex at O. In accordance with previous remarks concerning the behavior of a piece under compression, we deduce that the part of the piece bounded by the contact arcs and shown shaded in the figure is pushed outward by the rolls in the direction of the pass.

To determine, therefore, the elongation of the piece we will proceed as follows:

The area $OMBB_1M_1$ equals the area of the triangle COC_1 minus twice the area sector of CMB; but the area of the triangle $COC_1 = \dfrac{CC_1 \times OD}{2}$ and the area of the sector CMB = area of circle C / 360 × angle MCB.

In order to symbolize these equations we will use r to denote the radius of the roll; p the pass (BB_1); t the original thickness of the piece (AA_1); and ϕ the approach angle (ACB).

The the area of the triangle COC_1 equals

$$\frac{(2r + p)^2 (t - p)}{8 r \sin \phi}$$

and the area of the sector CMB equals

$$\frac{\pi r^2}{360} \phi$$

The shaded area will be given by $OMBB_1M_1$ equals

$$\frac{(2r + p)^2 (t - p)}{8 r \sin \phi} - \frac{\pi r^2}{360} \phi$$

As we have noted above, this must be equal to the area of a rectangle of height p and base of length l, the value of which latter quantity is given by equation [1] in the accompanying table of formula. The value of the average base l_0 of the shaded area is indicated by equation [2] in the same table.

The elongation Δ of the piece will evidently be $l - l_0$, and referring Δ thus found to the total length of the piece gripped by the rolls, we will have the elongation per unit length Δ_1. Also referring to Fig. 2, the total length of the piece gripped by the rolls is as in equation [3]. The percentage of elongation is

$$\frac{100\,\Delta}{r \sin \phi}$$

This equation besides showing the elongation obtained by rolling a piece of metal, furnishes also other valuable information, namely, a check on the safety of the rolling operation, by comparing the Δ% with the tensile-strength test of the material in question. In the event that the value of Δ% is too large for safely straining the piece, or should it happen to be too conservative, it will always be possible to readjust the pass of the rolling mill to suit, because Δ is a function of ϕ.

In order to find the side spread (σ) of the piece caused by the roll pressure we will refer to Fig. 3, which is a longitudinal cross section through the rolls. Let CC and C_1C_1 be the axes of the rolls, $AA_1 = t$ the original thickness of the piece, and $BB_1 = p$ the pass. In this case, since the expulsion angles AOA_1 are equal for both sides of the piece, the total spread will be twice the spread of one side.

By reasoning the same as in the case of Fig. 1, we can easily see the amount of side spread is given by the shaded areas, namely, AOA_1 and B_1O_1B. In this case the shaded area is given by the difference of the areas of the triangles AOA_1 and BO_1B_1, which depend upon the value of the pressure angle α because angle $DAO = \alpha/2$. The value of α may be found by returning to Fig. 2 and noting that the angle COD equals angle DBO minus angle OCB. However, tan DBO equals OD/DB and OD equals $(CB + BD)$ tan OCD. Working further and substituting for the angle DBO, and then symbolizing the resulting equation in accordance with the notation already adopted, equation [4], which gives the value of the pressure angle, is obtained.

It should be noted that the pressure angle is also a function of the approach angle ϕ, and once the value of the pressure angle has been calculated it is easy to find, by referring to Fig. 3, the area of the shaded portion, which divided by the pass will give the amount of the side spread σ of the piece. The side spread at each side of the piece is as indicated by equation [5]. If w is the width of the piece, the total spread per unit of width will be 2σ divided by w and the percentage spread will be as shown in equation [6] in the accompanying table of formula. Equation [5] shows that the side spread is independent of the width of the piece, but it depends entirely on the values of the original thickness t and the pass p.

Formula for Rolling Mill Data

ROLLED LENGTH

$$l = \frac{1}{p}\left[\frac{(2r+p)^2(t-p)}{8r \sin \frac{\phi}{2}} - \frac{\pi r^2}{360}\phi\right] \quad \text{.....[1]}$$

AVERAGE BASE l_0 OF SHADED AREA, FIG. 2

$$l_0 = \tfrac{1}{2}\left[\frac{(2r+p)\ (t-p)}{4\,r \sin \phi} + r \sin \frac{\phi}{2}\right] \quad \text{.....[2]}$$

ELONGATION PER UNIT LENGTH

$$\Delta_1 = \frac{\Delta}{r \sin \frac{\phi}{2}} \quad \text{.....[3]}$$

PRESSURE ANGLE α

$$\frac{\alpha}{2} = \tan^{-1}\left(\frac{\left[r + \frac{p}{2}\right]\tan\frac{\phi}{2}}{\frac{p}{2}}\right) - \frac{\phi}{2} \quad \text{.....[4]}$$

SIDE SPREAD OF METAL

$$\sigma = \frac{(t^2 - p^2)}{p} \tan \frac{\alpha}{2} \quad \text{.....[5]}$$

PERCENTAGE SIDE SPREAD

$$2\sigma\ \% = \frac{200\,\sigma}{w} \quad \text{.....[6]}$$

In conclusion the author wishes to present a practical application of the foregoing formulæ by solving the following problem: In the cold-rolling operation a strip of 0.20 per cent carbon steel is put through a 10-inch mill. The strip before rolling is 2 inches wide and 0.065 inch thick. The pass is 0.050 inch. Find the percentage elongation and side spread.

The first step is to find the approach angle. The fundamental equation of a rolling mill is

$$t = p + 2r(1 - \cos \phi)$$

Solving for ϕ.

$$\cos \phi = 1 - \frac{t-p}{2r}$$

and from the data above

$$\cos \phi = 0.9985$$

or $\phi = 3$ degrees 8 minutes

From the above data and equation [4] $\alpha/2$ equals

$$\tan^{-1}\left(\frac{\left[r + \frac{p}{2}\right]\tan\frac{\phi}{2}}{\frac{p}{2}}\right) - \frac{\phi}{2}$$

$$= \tan^{-1}\left[\frac{5.025 \times \tan (1 \text{ deg. } 34 \text{ min.})}{0.025}\right]$$

$-$ 1 degree 34 minutes

= 78 degrees 7 minutes

The data in full is as follows:

Roll radius, $r = 5$ in.
Original thickness, $t = 0.065$ in.
Pass, $p = 0.050$ in.
Width of strip, $w = 2$ in.
Approach, $\phi = 3$ degrees 8 minutes $= 3.133$ degrees
$\sin \phi = 0.05466$
$\cos \phi = 0.9985$
$\frac{\phi}{2} = 1$ degree 34 minutes
$\sin \frac{\phi}{2} = 0.02734$
$\frac{\phi}{360} = 0.0087$
Area of roll cross-section, $\pi r^2 = 78.5$ in.^{2}
Pressure angle, $\alpha = 156$ degrees 14 minutes
$\frac{\alpha}{2} = 78$ degrees 7 minutes
$\tan \frac{\alpha}{2} = 4.75219$

To find the elongation, using equations [1], [2] and [3], we obtain

$$l = \frac{1}{0.050}\left[\frac{(10.05)^2 \times (0.015)}{8 \times 5 \times 0.05466} - 0.0087 \times 78.5\right]$$

$= 0.2$ in.

$$l_0 = \frac{1}{2}\left[\frac{10.05 \times 0.015}{4 \times 5 \times 0.05466} + (5 \times 0.02734)\right]$$

$= 0.13725$ in.

and $\Delta = l - l_0 = 0.06275$ in.

or in percentage,

$$\Delta\% = \frac{6.275}{5 \times 0.05466} = 24.6 \text{ per cent of the}$$

original length of the piece gripped by the rolls.

To find the side spread on either side, using Equations [5] and [6] we obtain

$$\sigma = \frac{(0.065)^2 - (0.050)^2}{0.05} \times 4.75219 = 0.164 \text{ in.}$$

The percentage spread is

$$2\,\sigma\% = 16.4 \text{ per cent}$$

The result thus obtained evidently shows that σ% is inversely proportional to w, the width of the piece. Now, because of the fact that in rolling-mills practice we are interested only in obtaining the highest possible value of the elongation Δ, the best economic operative conditions will be furthered by using a strip as wide as possible consistent with the dimensions of the rolls, the power of the mill and above all the degree of uniformity desired in the thickness of the finished strip.

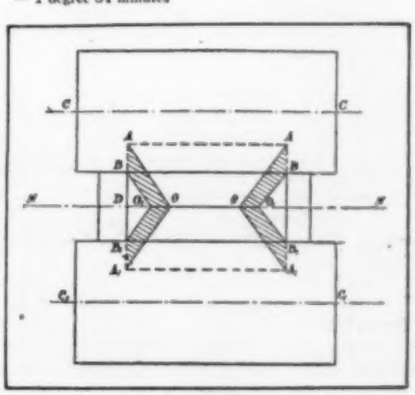


FIG. 3—LONGITUDINAL CROSS-SECTION THROUGH THE ROLLS

French in Conflict Over Tariff

Comite Des Forges Accused of Conducting Campaign to Erect Barrier Against Cheaper Products From United States—Lorraine Steel Shipped to Germany at Half the Price Government Permits it to be Sold in France

BY FRANCIS MILTOUN
Paris Correspondent of The Iron Trade Review

THE famous Comité des Forges is still in the public eye. Some of tacks upon it are manifestly unfair. In the chaos of the war some powerful institution was needed to take the reins and co-ordinate the efforts of the iron and steel industry, and if the effort was not altogether successful, the actual benefits were appreciable.

The committee now declares that a campaign is being waged to discredit it. It denies that it is seeking to influence the country against foreign products which might be imported at less expense than they can be made in France. Its policy seems to be to supply all that it possibly can for the reconstruction of northern France, and the encouragement of the export of the excess, when there is any needed, which is not yet.

The point is of interest to the American manufacturers of iron and steel for the bearing it may have on the remaking of French tariffs, and it is advisable to watch legislation and also watch for 1919 statistics when they are made public.

If the Comité des Forges goes to pieces it may be to the advantage of American manufacturers. If it holds together, and is able to carry out the economic tariff program, it may mean the closing of the door to American iron and steel.

The various steel works represented in the committee are said to have already received orders from the French bureau of industrial reconstruction for products to the value of 550,000,000 francs.

What is less explicable is how and by what means the government was induced to allow Lorraine steel to come into France only at 60 francs for 100 kilos (220 pounds), whereas the same product is being shipped into occupied Germany at the base price of 30 francs.

"How," writes Gustave Tery, editor of *Work*, "is France to have an export business in steel products if she is to be eternally handicapped by this 30 francs a hundred kilos for raw material from its own mines and furnaces?"

* * *

Rail and Plate Output Increase

The following statistics of iron and steel production in France for the first four months of 1917, 1918 and 1919 are particularly interesting as showing the increase in the output of rails as a result of efforts to get new railroad lines in operation throughout the industrial districts of northern France. The only other line in which production has increased is plates.

	1917	1918	1919
Pig iron, tons.....	235,281	116,059	56,542
Blooms, billets and bars.	550,134	350,498	230,141
Machine steel and iron...	17,348	22,345	7,940
Plates	83,402	57,006	77,550
Iron and steel wire.....	43,942	7,375	14,233
Iron and steel rails.....	38,937	39,372	90,563
Tin plate	13,982	19,479	7,498

* * *

Production of Lorraine Plants

The iron and steel plants concentrated in the region of Metz-Thionville include the following equipment: Sixty-eight blast furnaces, 27 converters, 10 open-hearth furnaces, distributed as follows:

The de Wendel plant at Hayange, Societe des Petits-Fils de Francois de Wendel: Nine blast furnaces of 100 to 200 tons capacity; six converters of 13 tons; four open-hearth furnaces of 30 to 45 tons; rolling mills for sheets and shapes.

Acieries de Wendel at Moyeuvre: Eight blast furnaces of 120 to 190 tons; four converters of 12 tons; rolling mills for shapes.

Acieries Thyssen at Hagondange (German, Stahlwerke Thyssen), Hagondang plant: Six blast furnaces of 300 tons; five converters of 30 tons; two open-hearth furnaces of 60 and 80 tons, rolling mills for shapes. Maizieres plant: Three blast furnaces of 12 tons, not in operation.

Acieries de Rombas (German, Rombacher Huttenwerke), Rombas plant: Six blast furnaces of 200 tons; six converters of 22 tons; four open-hearth furnaces of 20 tons; rolling mills for shapes. Mazieres (Mosellhutte) plant: Four blast furnaces of 180 to 200 tons.

Acieries de Knutange (German, Lothringer Huttund Bergwerks Verein): Ten blast furnaces of 200 tons; six converters of 30 tons; rolling mills for shapes. In this enterprise Belgian interests have 11,000,000 francs of the 72,500,000 capital.

Hauts Fourneaux d'Uckange (German, Gebruder Stumm de Neunkirchen, Sarre): Six blast furnaces of 150 tons.

Hauts Fourneaux de Thionville (German, Gewerkschaft Roechling): Four blast furnaces of 150 tons.

Hauts Fourneaux d'Ottange (German, Deutsch Luxemburgische): Three blast furnaces of 120 tons.

Hauts Fourneaux d'Audun le Tiche (German, Gelsenkirchen): Four blast furnaces of 180 tons.

Hauts Fourneaux de Redange (German, Dillinger Huttenwerke): Three blast furnaces of 100 tons. Forty per cent of the capital of this company is owned by Frenchmen.

The foregoing statistical summary is compiled from "The Reconstituted, North and East," and may be considered as the first official statement as to the working facilities of the region, which with Briey proper forms the kernel of the Lorraine industry.

The *Bulletin des Metaux* gives the production of iron ore in Lorraine for the month of July as 650,000 tons. Shipments from accumulated stocks for the month were 800,000 tons, the stocks on hand at the mines exceeding 1,500,000 tons. France, including Lorraine, consumed 350,000 tons and 200,000 tons were shipped to German plants across the Rhine, while 155,000 tons were consumed by the plants of the Saar and the occupied regions of Germany. The surplus went to Belgium and Germany.

* * *

Prices in France Going Up

La Metallurgie Francaise states that the metal market recently has been considerably affected by the coal shortage. Coal and its transportation dominates the economic situation.

Iron and steel prices in France will soon have to be increased all along the line. The 60 francs per 100 kilos, base, established by the ministry of industrial reconstruction has already given way in many instances to 70 francs, base. This applies to rolling mill output. Thus French plants are seriously handicapped as regards to contiguous competitors. Coke for France now costs 105 francs a ton as compared with the equivalent of 65 francs for plants in Lorraine and in the occupied districts of Germany.

* * *

Foreign Labor in France

In late August a decree was signed regulating the formalities for the introduction of Spanish labor into France. to aid those industrial establishments which demanded a new bureau of immigration. Spanish labor was largely used before the war in Southwestern France, as was Italian labor in Southeastern France, and Belgian in Northeastern France. Of all foreign labor in France the Belgians came first in numbers, the Italians second and the Spaniards third.

Advances Theory on Arc Welding

Investigations Show Electric Current Merely Furnishes Heat in Form of Arc While Welding is Accomplished by Metal Expelled From Electrode in Form of Metallic Vapor—Short Arc is Best

BY RALPH G. HUDSON

ALTHOUGH metallic arc welding fully for a considerable period had been employed successit was appreciated that its application was based upon empirical methods, and to make greater use of such welding in shipbuilding it was evident that its basic principle should be investigated as thoroughly as possible so that inferior methods of metallic arc welding might be eliminated. The object of this article is to present the results of an investigation of this character conducted in the laboratories of the Massachusetts Institute of Technology by the welding committee of the Emergency Fleet corporation in the summer of 1918.

It should be noted that at the beginning of this investigation no satisfactory explanation had been given for the transmission of metal from electrode to plate. In downward welding the deposition of metal might be attributed to gravitational force but in upward welding no such explanation could be offered. The fact that an electric current is employed in the process suggested the possible existence of forces of electrical origin which might pull metal from the electrode to the plate. Calculations of the magnitude of the electrical forces that may exist during metallic arc welding indicate that they are negligible and may therefore be eliminated as possible causes of the action. This view is further substantiated by the fact that satisfactory welding may be performed with current flowing in either direction or with alternating current and that such differences as may exist with different directions of the current may be explained by consideration of the relative heating properties of such currents at the terminals of an electric arc. In conducting this investigation an attempt was made to obtain a photographic record of successive phases of the welding arc by means of a high-speed motion picture camera. The camera was specially constructed and when set up was found to operate satisfactorily at a rate of 32 pictures per second; the ordinary camera operates at 16 pictures per second. One thousand feet of film were exposed with this camera, the character of the arc being varied by changing the direction of the current, length of arc, type of electrodes, etc. In photographing an electric arc of any kind the luminosity of the arc itself is so great that the other parts of the apparatus including electrode, plate, molten drops, etc., do not appear on the film except as they may appear in silhouette against the arc.

The principal use made of these films was to examine them one by one with a low-power microscope with transmitted light. A systematic examination of 16,000 pictures in this manner disclosed certain important features mentioned later. Although the photographic difficulties were evident, the writer decided to take further magnified pictures of the arc with a short exposure focal plane shutter. A camera was set up which would magnify the arc about eight diameters. Instantaneous photographs of the welding arc obtained with this camera suffered from the same domination of the plate by the arc to the exclusion of all other phenomena.

While focusing this camera it was realized, however, that more could be seen with the eye on the ground glass than could be obtained photographically or by direct observation through dense glasses, and the writer therefore began an extended study of metallic arc phenomena as seen in magnified form on the ground glass. With this device the action of the arc could be examined without screening the eyes and with the further advantages offered by magnification and observation of the action in its true color. When an arc is struck between a steel electrode and a steel plate the end of the electrode and a spot on the plate are heated to a high temperature and metal is transferred from the electrode to the plate. The electrode is heated to a higher temperature than the

Theories Conflict

THERE are many theories as to how the electric current acts in arc welding and how it should be controlled. In the accompanying article, the author presents the results of investigations which seem to show that minute liquid particles are shot from the electrode by the pressure of quickly formed vapors and gases under the intense heat of the arc. The particles striking fluid metal solidify with it but others which strike solid metal bounce off or adhere without fusion. The article is from the October number of the Journal of the American Welding society, the official organ of the American bureau of welding, in which many of the national engineering and scientific societies are represented.

FIG. 1—EFFECT OF LENGTH OF ARC UPON SIZE OF ELECTRIC GLOBULE
At the right is globule developed with a very short arc; in the middle with a moderate length arc; and at the left, with a very long arc. These are $\frac{1}{16}$-inch electrodes magnified about 5 diameters

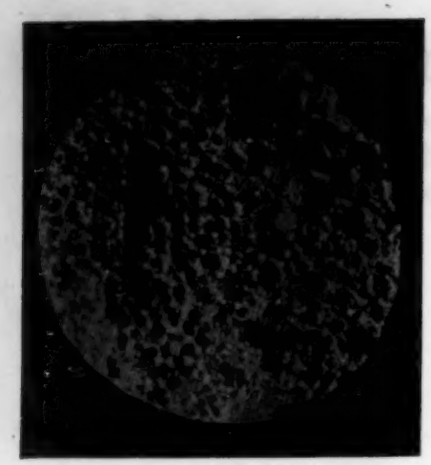


FIG. 2—SURFACE OF AN ELECTRODE ON THE INTERIOR ELECTRODE END OF A LARGE GLOBULE

plate because the heating action of the arc is more concentrated in the case of the electrode and because the heat conduction away from the hot spot is greater in the case of the plate. An analysis of steel electrodes usually reveals the presence of at least 10 elements: Iron, carbon, manganese, copper, sulphur, phosphorus, silicon, oxygen, nitrogen, and hydrogen. Since the melting points and other thermal constants of these elements and their compounds vary widely and their chemical affinities are quite different, it is to be expected that the constituents of an electrode subjected to a high temperature will change from solid to liquid or gaseous form successively and not at the same instant. Since the melting point of iron is higher than that of any other constituent of an electrode with the exception of carbon, which combines rapidly with oxygen at welding temperatures to form carbon monoxide, it is furthermore to be expected that in the welding process the iron constituent of the electrode will melt last.

The thermal changes just described are known to take place during the application of heat to any complex substance. In metallic arc welding the temperature changes which take place differ, however, to a marked degree from the changes incident to the usual methods of heating metals in that a small mass of the electrode in welding is subjected to a high temperature for a very short interval of time. The distinctive thermal feature of metallic arc welding is then the sudden rise and fall of temperature in the metal transmitted to the plate. Under the circumstances it may be seen that the melting of the iron is delayed by the heat absorbed by the other constituents of the electrode and that this fact together with the limited time of application of high temperature disproves the possibility that the iron is completely vaporized in the welding process. When a projectile is fired from a large gun, for example, the initial temperature of the gas behind the projectile is believed to range between 3000 and 4000 degrees Cent. Although this temperature greatly exceeds the melting point of the material of the projectile, there is little evidence of melting on the surface of the projectile because the projectile is not heated by the adjacent gas for a period long enough to melt its surface.

Gases Form in Electrode

An increase of temperature in most materials is accompanied by a marked increase in volume and in chemical changes resulting in the formation of gases the reaction is usually accompanied by an immense change in volume. While various changes in volume may take place among the constituents of the electrode during metallic arc welding, the greatest possibility for such expansion may be found in the formation of carbon monoxide. It is therefore to be expected that a globule will be formed by such expansion on the end of the electrode during welding. Typical electrode globules developed in this manner by various lengths of arc during the welding process are shown in Fig. 1. Each globule contains a cavity which may be seen clearly during welding on the ground glass of the camera described above and is also present in the cold contracted globules shown in the illustration. In the smaller globules the cavities are usually open and resemble small drill holes, while in the larger globules the cavities are usually closed and are surrounded by a thin skin of metal.

An electrode globule maintained in continuous contact with the plate to prevent formation of the glaring arc and heated by a heavy current may be seen under magnification on the ground glass to expand and blow out minute particles at high velocity from the thinnest side walls, a contraction of the globule occurring after each expulsion of particles. The particles appear to originate in the inner electrode surface of the globule. If the globule is suddenly detached and the arc interrupted at the same instant in ordinary long arc welding, the inner electrode surface of the globule presents the appearance shown in Fig. 2. The pitted electrode surface suggests irregular fusion due to different temperatures of fusion, vaporization and chemical combination of the ingredients under the influence of rapid changes in temperature.

Constituents of Vapor Unknown

Owing to the complex structure of the electrode, it is not easy to determine the exact nature of the vapor content of the globule. That the vapor consists partly at least of carbon monoxide gas is suggested by the fact that such globules do not form in general when the end of the electrode is heated in a reducing atmosphere. It is also found impossible to weld with an electrode containing practically no carbon in a reducing atmosphere. In welding under water it was observed that bubbles of gas rise continuously to the surface of the water and burn, indicating the possible dissociation of the water with the absorption of oxygen by the electrode and the rejection of hydrogen to the surface of the water. After a globule has been maintained for several minutes at high temperature in contact with a plate in air, it was observed that all expulsion of particles ceased. It may be inferred from this that all of the vapor forming constituents of the globule had been burnt out.

An examination of the motion picture films which show successive views of the arc, each with 0.0005 second exposure, reveal occasional pro-

FIG. 3—METAL PROJECTED FROM A HOT ELECTRODE TO A COLD PLATE
The incandescent electrode was moved at speed of 4 feet per second over surface of electrically insulated plate. Magnification approximately 6 diameters

tuberances on the electrode globule within the crater region and the paths of projected particles may also be seen silhouetted against the arc itself. That these phenomena are only found at intervals in examining the film is undoubtedly due to the fact that such particles in the arc stream are rendered invisible by the luminosity of the arc and that such protuberances and projectile paths are only visible when they happen to screen the arc. The expelled particles found about the work when welding—the familiar bluish-gray dust of the welding room—or when collected under water are found to be spherical shells indicating that a portion of the vapor within the globule is carried away with the projected particles. A photograph of these projected particles, magnified 20.7 diameters, is shown in Fig. 5.

If the electrode while welding is suddenly swept across an adjacent flat insulated surface, small spots of metal are found on the surface at regular intervals over the surface traversed by the hot electrode. A photograph of a small portion of such a path is shown in Fig. 3, and a more highly magnified view of one of the spots in Fig. 3. The regularity of spacing of these spots when the differences are not magnified is quite striking. The same effect was observed by holding an incandescent electrode, just removed from ordinary welding, over the rim of a revolving iron wheel. It was determined in this way that the average frequency of projection was 50 per second. The duration of such a projection was approximately one-fifth of a second; the projection terminating with the cooling of the electrode.

Particles Expelled by Vapor

It would appear from the observed facts that the metal deposited during metallic arc welding is transmitted in part at least in the form of minute particles which are projected from the electrode globule by the internal expansion of some vapor, possibly carbon monoxide. The expelled particles pass through the arc too rapidly to become vaporized and reach the plate in a fluid state. If the expelled particles strike solid metal they either ricochet along the surface, which explains the accumulation of iron dust in the welding room, or flatten out without fusion, the most common cause of poor welds. If the particles strike a fluid metal they penetrate the fluid and solidify with the molten surface of the plate.

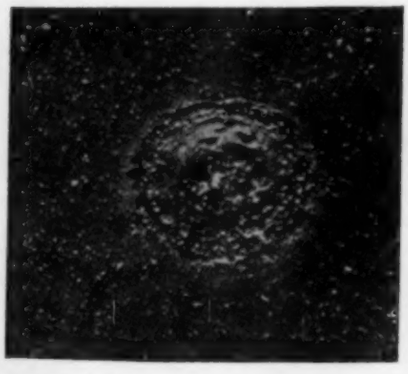


FIG. 4—NUCLEUS OF METAL PROJECTED ON A COLD PLATE FROM INCANDESCENT ELECTRODE

It is a well-established fact that the best welding is obtained with the shortest arc and the worst welding with the longest arc. It will be noted in Fig. 1 that the size of the electrode globule also increases with the length of arc, the best welding being obtained with the smallest globule. A small globule implies greater concentration of projected particles in the direction of the opposite fluid spot. In downward welding a large globule becomes elongated by gravity. The lower part of the hollow globule becomes thickened by downward flowing metal; the side walls become stretched and thinned; and particles are projected wastefully through the side walls at right angles to the arc. The globule as a whole frequently breaks away from the electrode and drops without fusion on the plate. Electrode ends rejected by a welder and presenting the appearance shown in Fig. 2, or of the large globule in Fig. 1, constitute substantial evidence of infective long-arc welding. In upward welding a large globule tends to fall to one side or the other by gravity and prevents the efficient projection of metal.

Any material which serves to increase the melting point of the surface of an electrode must, in accordance with the stated theory, improve the conditions under which particles are projected from the electrode globule. The cup shaped surface formed at the end of such an electrode will reduce the amount of indirect projection of particles to a minimum and the increased stability of the arc will reduce the difficulty of manipulation of the electrode, since the length of the arc may be varied over a greater range without interruption. It appears that most of the coatings suggested for electrodes perform the function of cooling the surface of the electrode by vaporization, and in some instances, owing to the rapidity of the action, remain in a fluid condition about the sides of the electrode globule. It should also be noted that since iron oxide has a higher melting point than steel, rust should not be removed from electrodes and that

FIG. 5—DUST WHICH ACCUMULATES AROUND WORK DURING WELDING. MAGNIFIED ABOUT 10 DIAMETERS

rusty electrodes usually work better than bright clean ones. In many cases the outside layer of bare electrodes may be changed by drawing and heat treatment so that it has a higher melting point than the interior. The ideal electrode would have a high melting point shell, tungsten for example, surrounding a lower melting point interior containing sufficient vapor forming constituents to eject metal constantly when heated by the electric arc.

Recommends Further Study

The writer suggests the following promising subjects for further study: *First*, a determination of the character of the vapor found in an electrode globule; *second*, a determination of the best surface material for electrodes, first cost and effect on the finished weld to be considered; *third*, the effect of welding in a reducing flame upon the character of the weld; *fourth*, an investigation of the value of welding under water as in the case of ships, tanks, etc.; and *fifth*, the use of materials other than steel in metallic arc welding. It will be noted, for example, that the zinc constituent of brass under the influence of a rapid increase in temperature may melt and vaporize before the copper constituent begins to melt. If the theory outlined above is correct, it would appear quite probable that satisfactory welding could be done with brass electrodes.

Foundrymen Hear Talk on Labor Problem

In addition to Eugene S. Willis of the Safety First Supply Co., Pittsburgh, who gave a talk on "Safety First as Applied to the Foundry," members of the Pittsburgh Foundrymen's association at a meeting held

Nov. 18, heard Col. Cameron C. Smith, chairman of the Union Steel Casting Co., Pittsburgh, who during the war served as production manager of the New York district army ordnance office and after the war was a member of the war claims board. Colonel Smith's topic was: "Industrial Unrest; Cause, Effect and Remedy."

Considerable discussion followed Mr. Willis' paper, much of it in connection with the use of goggles and leggings in the foundries. It was brought out that the workmen generally are opposed to wearing goggles at first, but that shop and foundry officials by perseverence can induce the men to see the advantage of this means of protection to the eyes. A plea for leggings that are cooler and more comfortable was made by those who have had experience with the men in the foundries.

Colonel Smith urged fairer treatment by employers of their workmen and traced the causes leading up to the present unrest. Until recently labor was regarded as the "under dog" by the public and enjoyed its sympathy. Public sympathy and political support coupled with thoughtlessness on the part of the employers in their treatment of the men created in the minds of the workmen the belief that they had a greivance and with the backing of the public and the politicians, they could do as they pleased.

Abuses Authority

Power in labor ranks is falling into the hands of irresponsible leaders, who have no respect either for law or for the rights of others and even today, there is a disposition on the part of the public to either wink at or excuse some of the violations of the law by labor. The speaker drew attention to the influence of the radical newspapers, printed both in English and foreign tongues and also the sullenness of labor in obeying the mandate of the courts as in the case of the coal miners' strike.

In offering a remedy for the situation, Colonel Smith drew attention to the lack of confidence of the men in their employers and of the employers in their men. It is his belief that while concessions should be made on both sides, the employers should hold out the olive branch in an effort to effect a reconciliation.

Making the shop an attractive place to work, by the introduction of recreation periods during the day, such as moving pictures during the noon hour, was one suggestion of Colonel Smith, who also favors shop stores where employes may buy necessaries at cost. He also stated that the employment of a trained nurse to look out not only for the welfare of the men but of their families is helpful in making the men more contented.

Getting Together With The Employes

BY A. B. WEEKS

THE clamor by labor organizations for increased wages, shorter hours, better working conditions, collective bargaining, and their attempt at industrial control through recognition of unions, and the closed shop have been especially insistent since the signing of the armistice. Our industries, both great and small, for economic reasons and to increase production have granted one demand after another in the way of wage increase and curtailment of hours, at the behest of labor organizations.

This clamor by organized labor is becoming louder, and the demands more insistent and we have reached that stage in our industrial life where not only our prosperity but our very existence is threatened, at least temporarily, through our disregard of the laws of business economics, particularly as they relate to international trade.

For many years there has been a contest between employers and outside forces, namely the labor unions, for the control of the men in various industrial establishments. Much has been said in meetings of the manufacturers' and employers' organizations of the necessity for a campaign of public education. The writer grants that the necessity for such a campaign exists, but that a campaign of this character would of itself cure the present labor unrest is doubtful. In the writer's opinion the time has arrived for an active campaign for the control of labor by the plant executive. The campaign on the part of labor leaders for the control of labor is so persistent, that the average workman is inclined to accept the teachings of the labor leader and classify the occasional remarks of his employer as "hot air from the boss." If the contest on the part of the labor leader for control is continuous, then employers' efforts must be continuous, collective and persistent.

In the writer's opinion much may be accomplished to gain the confidence and control of our men by closer co-operation with them; by a series of thoroughly organized round-table conferences, regularly held whereby the employer may gain a better understanding of the workman's viewpoint, his necessities, and the conditions surrounding his life, and at the same time show the workman that the matter of wages and hours of work are not governed by the mere arbitrary ruling of the "boss," but are, on the other hand, governed by the economic laws which control our national and international trade relations.

The average workman is an intelligent, fair-minded, and patriotic citizen, and by instructing him in the fundamentals of the natural economic laws governing industry, his viewpoint toward wages, hours of labor and production will be changed through his ability to analyze cause and effect. And in place of the present misunderstanding and unreasonable demands we shall soon have co-operation and harmonious relations, without the intervention of labor unions.

Cannot the employers get together along these lines and effect a solution of our present vexing labor questions? This lack of co-operation and understanding between the employer and his employe in the years past paved the way for the labor union. Is it not worth while, by endeavoring to establish confidence, co-operation and understanding between employer and employe, to arrive at those better relations which will make the labor union unnecessary and undesirable?

The answer to the question "In whose hands shall industrial control rest, the plant executive or the labor leader?" lies with the employer himself. Which shall it be? Are you going to answer the question, or allow the labor leader to answer it for you?

The author, A. B. Weeks, is general manager, Canadian Northwest Steel Co., Vancouver, B. C.

Leslie E. Freeman, according to announcement by the American Chamber of Commerce of Brazil, 37 Liberty street, New York, has arrived in this country to open trade relations be-

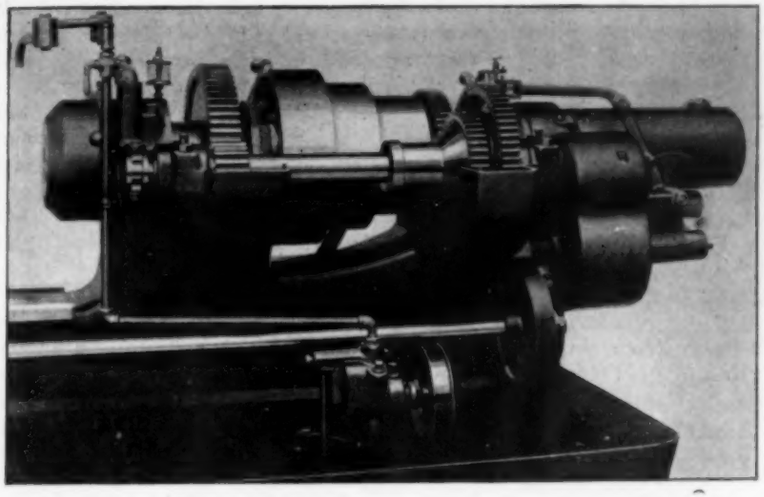


FIG. 1—REAR VIEW OF THE HEAD WITH GUARDS REMOVED SHOWING BACK GEARS

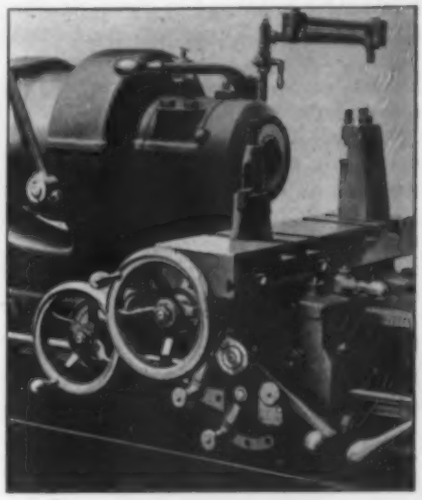


FIG. 2—HEAVY DUTY CARRIAGE

tween the United States and Brazil. Mr. Freeman is equipped with data concerning the markets of Brazil and will supply this information as requested to manufacturers. The chamber is affiliated with the Rio de Janeiro chamber and plans are being made for the publication of a Brazilian-American trade review which is to be printed in this country every month. Brazil offers an excellent market for American products.

Equips Turret Lathe With Double Friction Gears to Insure More Power

THAT machine tool builders recognize the necessity of designing tools of greater production capacity to meet present-day conditions is evidenced by the turret lathe shown in the accompanying illustrations. This tool, which is a recent development of the Warner & Swasey Co., Cleveland, is designed to meet the demand for a machine of great power and strength for finishing gear blanks, forgings and tough, alloy steel parts of various kinds.

The bed and headstock are box section, cast integral, while the turret saddle and carriage travel on flat ways. Both units are equipped with gibs for compensating for wear.

The machine is equipped with double-friction back gears which transmit ample power for heavy forming and facing cuts on bar and chucking jobs and provide a wide speed range. Nine speeds are available, three for each step on the driving cone.

The machines are equipped with either a standard or heavy duty carriage. The heavy duty carriage is equipped with a power cross feed and manually operated longitudinal feeds. The cross feed also can be operated by hand as occasion requires. Six power cross feeds and traverse are obtainable in the apron. The gears in the apron run in oil.

The cross slide is equipped with a setting dial and adjustable stops also are provided to work while the slide is traversing in either direction. The front tool post is round and has an adjustable wedge arranged to be swiveled at any angle. A cutting-off

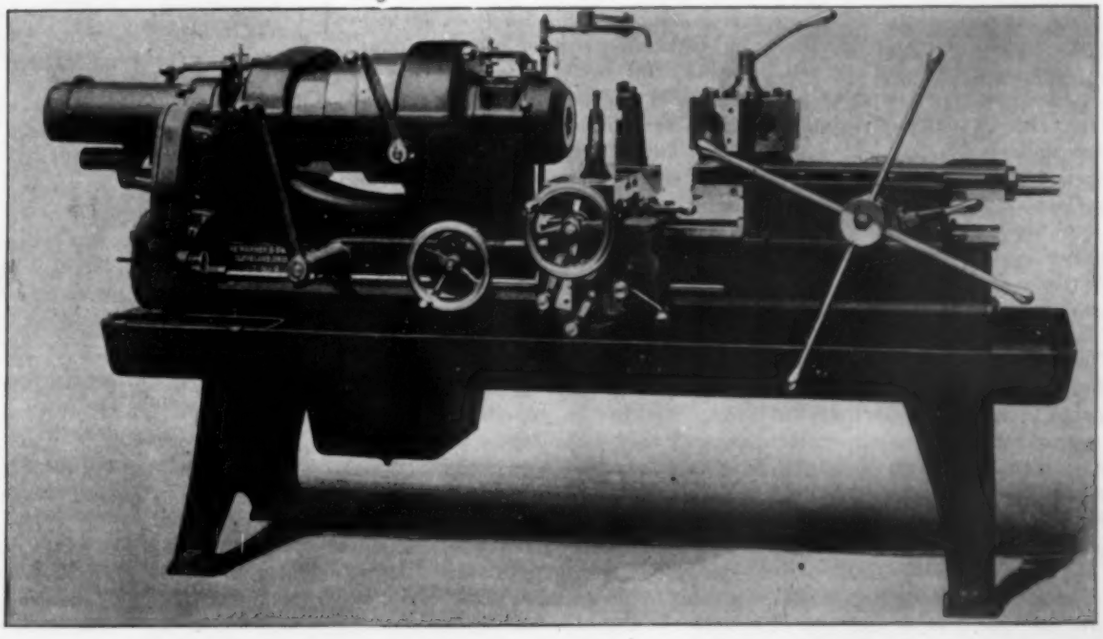


FIG. 3—HEAVY-DUTY, DOUBLE-FRICTION, BACK GEARED TURRET LATHE FOR MAXIMUM PRODUCTION

tool holder is located at the back side of the slide. Either of these tool holders may be removed to permit special forming tool holders to be substituted.

The standard type of carriage is of the design that has been furnished by the company for a number of years. Hand longitudinal and cross feeds are embodied in this carriage. Adjustable stops are provided for the cross slide on this type of carriage while the

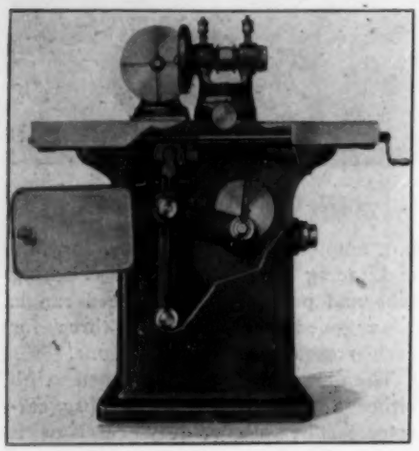


FIG. 1—AN ADJUSTABLE CRANK DISK ACTUATES THE PLATEN

tool posts are the same design as used on the heavy duty carriage.

The automatic chuck and bar feed are operated by a long lever in front of the headstock. A stepped wedge automatically adjusts the collet for slightly varying diameters of stock. A master collet and bushing pads are regularly furnished for holding 2¼-inch round stock unless otherwise specified. Bushings for hexagonal stock can also be accommodated by this collet. Square stock requires a square stock master collet and bushing pads. Extra capacity collets can be used for holding short lengths of stock, larger in diameter than the hole in the spindle.

The hexagon turret is arranged for holding tools with or without shanks. The six tool holes are counterbored for centering plate tools and are fitted with draw bolts.

The turret is revolved automatically by the backward movement of the slide. The locking bolt is at the front end of the slide and works into steel tapered bushings inserted in the bottom of the turret, close to the outside, directly under the cutting tool. Independent adjustable stops operate automatically for each position of the turret. They are disengaged by power feeds. They are readily adjusted for the length of each cut.

The turret saddle has a supplementary taper base to adjust the tool holes in the turret to insure correct alignment with the spindle. Taper gibs, fitted the entire length of the saddle on each side, provide a ready means for adjusting the slide sidewise. Any one of four feed changes, 38, 64, 107 and 190, is instantly obtained by moving a lever. The automatic trip operates in connection with independent adjustable stops for each hole in the turret.

An oil pump of the rotary type, which operates when the machine is running in either direction, is provided.

New Face Grinding Unit is Self Contained

A compact, self contained face grinding machine designed to expedite production on routine work recently was developed by the Cleveland Machine Tool Co., Cleveland. The base is a one-piece box section casting, provided with a door at the front for inspection and oiling of the working parts, and a door at the side for access to a part of the column that can be utilized for tool storage.

The platen is 42 inches long and 9¾ inches wide and travels on one V and one flat way. Due to the fact that the platen is longer than the ways, these are always covered which reduces the wear caused by lodgement of particles of abrasive material. The platen, which is equipped with a crank handle for adjusting the relative position of the stroke, is fed back and forth by means of a crank disk driven by a worm and worm gear. The throw of oscillation can be quickly adjusted from no motion to a stroke of 6 inches. Thus, work 12 inches in diameter can be handled by the machine. Six changes of feed are obtained by a 3-step cone pulley and a 2-speed countershaft. Provision for carrying away cutting fluid from the platen is made in cases where it is desirable to employ wet grinding.

The head carrying the grinding wheel is fitted to a saddle, which is located on the main part of the base through the medium of a dove-tail slide. Gibs are provided to take up wear. The saddle adjusting screw is equipped with a micrometer dial for making close settings while taking finishing cuts. The grinding wheel head rotates on a king pin and can be swiveled to any desired angle.

The grinding wheel spindle is hardened and ground and runs in phosphor bronze boxes, adjustable for wear. The driving pulley is located between the bearings and the grinding wheel flanges are of ample size to insure gripping the wheel properly. A wheel guard is provided.

The work head is secured to the back of the column through the medium of a dovetail slide. It rests on its own saddle which has a longitudinal adjustment of 6 inches. The saddle is secured to the column by a hand clamping screw to permit quick adjustment.

The work driving spindle is hardened and ground and runs in phosphor bronze bearings which are adjustable for wear. The spindle nose is threaded to accommodate a 10-inch faceplate which has two ⅝-inch T-slots located at right angles. Two draw bolts and two collets, ½ and 1-inch, form part of the regular equipment. The machine is clearly shown in the accompanying illustrations.

Warns of Danger Lurking Around Oil Room

Gasoline throws off an explosive vapor even at extremely low temperatures, according to an article prepared by S. D. Rickard, consulting engineer of the Wayne Oil Tank & Pump Co., Ft. Wayne, Ind. Five gallons of gasoline will generate 8000 cubic feet of gas, which, when ignited, expands to 4000 times this space. It is stated that the explosive force of one gallon of gasoline properly mixed with air and compressed, is

FIG. 2—WHEEL AND WORK HEADS HAVE READY ADJUSTMENTS

equal to 83 2/3 pounds of dynamite. The vapor from gasoline is heavier than air and it settles on the floor much as a stream of water, except that it is invisible. This vapor will remain in a depression for days and even weeks, unless disturbed by a circulation of air. The records show that under certain atmospheric condi-

tions spontaneous combustion will occur in this vapor.

Kerosene, the article states, is not as dangerous as gasoline, yet at a temperature of 70 degrees or over, it throws off an explosive vapor. At a higher temperature, in order to properly ventilate a room in which there is an open tank of kerosene, a circulation of air equal to 200 cubic feet per minute for each gallon exposed should be kept up. These figures vary with the volatility of the oil and the temperature of the air and oil. All petroleum products, including lubricating oils, produce an explosive vapor. The danger from lubricating oils is chiefly from spontaneous combustion.

The gravest danger which confronts the consumer of oils, aside from the gasoline danger, is from paint oils, such as linseed oil and turpentine. A piece of cotton waste saturated lightly with equal parts of linseed oil and turpentine, will if left in a closed room, such as an oil house or storeroom burn from spontaneous combustion within three hours.

Builds Large Oil Engine

A fuel oil engine made by the Nordberg Mfg. Co., Milwaukee, a 5-cylinder 2-cycle engine developing 1250 horsepower, is claimed to be the largest oil engine in America. The main cylinders are 30¾ inches in diameter and have a 26-inch stroke.

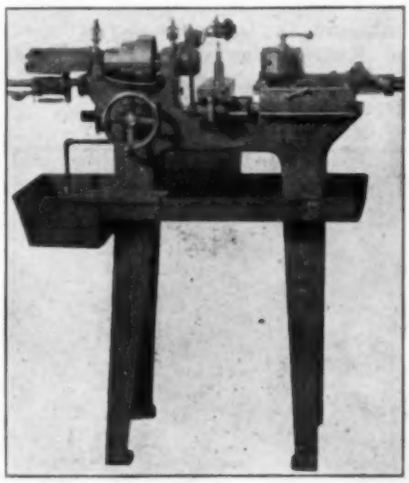


FIG. 1—SMALL SCREW MACHINE WITH LEVER FEED CUT-OFF

Total weight of the engine is about 400,000 pounds.

A scavenging pump driven from one end of the crankshaft furnishes air for cleaning the cylinders of burnt gases. A high-pressure air compressor is bolted to the side of the scavenging pump and driven from the crosshead through beams and links. Each cylinder has four scavenging valves to give good distribution of the air from the air space in the cylinder head to the working cylinder. The fuel oil is injected through a needle valve designed to thoroughly atomize fuel up to 14 degrees Be.

Three of the cylinders are equipped with starting valves cam operated and so arranged that as the air starting valves are thrown out of action, the fuel valves are thrown into action. The fuel is pumped to the atomizer valves by five separate fuel pumps, one for each cylinder. They are required to pump against a pressure of 1500 pounds.

The regular 36-hour shop test, which was run recently, showed that the fuel consumption of the engine at full speed was about 0.42 pound of oil per brake horsepower per hour. The lubricating oil consumption for the 36 hours was about 5½ gallons, which included the oil for every part of the engine. The engine was required to start and reach full speed in six seconds and be ready to take full load immediately.

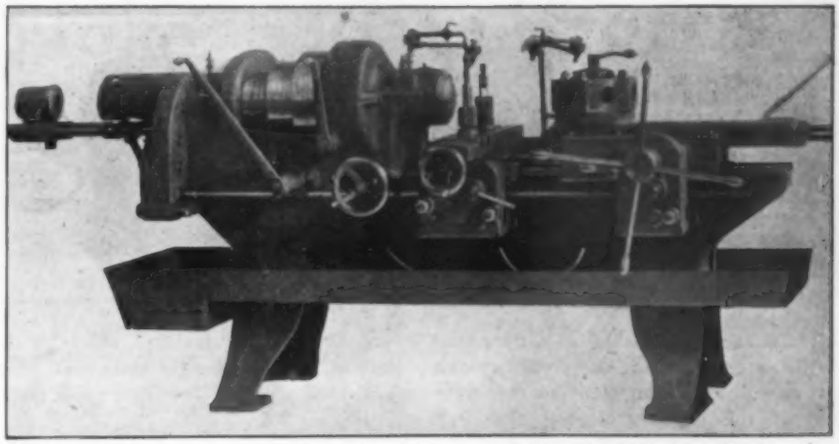


FIG. 2—LARGE SCREW MACHINE ON WHICH UNITS ARE INTERCHANGEABLE

Units of Screw Machines Are Interchangeable

A new line of handscrew machines, embracing 5 sizes ranging from ⅞-inch to 2⅞ inches, was recently designed by the Foster Machine Co. Elkhart, Ind. The unit principle of design has been carried out in the machines, many of the parts being interchangeable and independent. In accordance with this idea three different styles of cut-off units have been designed: One with lever feed, one with end screw feed, and the other with power feed. The power feed to the turret also is a separate unit and therefore, a machine may be built with either power feed or with hand feed to the turret slide. The automatic chuck and bar feed also are built as independent units.

The two largest machines are equipped with friction clutches mounted on the spindles between the cone pulley and the friction gear thus serves to engage the spindle in the driving connection direct with the cone pulley on one side or with the bank gears through a large diameter spindle gear on the other side. The frictions are of the cone type and are operated by a hand lever.

The vertical lock bolt of the index mechanism is mounted underneath the front side of the turret almost directly beneath the working tool. The end of the lock bolt lever, which intermittently engages the tumbler for withdrawing the lock bolt preliminary to the indexing of the turret is equipped with a roll for the sake of sensitiveness and reduction of wear.

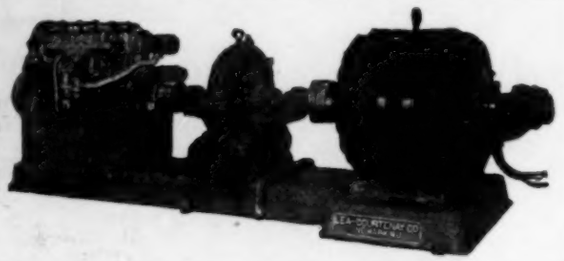
The cross feed apron is similar in design to the saddle apron with the difference, however, that different sliding gears are introduced in the train to obtain the reverse of the feed movement. The feed friction which works in conjunction with the two large intermediating gears, is operated by rapid acting cam manipulated by a hand lever.

For applying the proper amount of cutting compound to the cutting tools, the larger machines are supplied with a double system of piping, one working in conjunction with the turret slide and the other with the cut-off. On the smaller machines where a smaller amount of the compound is required, a single system of piping is used. The accompanying illustrations show the largest and smallest of the five machines.

The Westinghouse Electric & Mfg. Co. has just announced the award of four annual war memorial scholarships

FIRE PUMP WITH DOUBLE DRIVE

The pump has a capacity of 1500 gallons per minute and is driven by a 150-horsepower alternating current motor and a 140-horsepower gasoline engine.



of $500 each established as a memorial to those employes of the company and its subsidiaries who went to the service of the country during the war. The successful candidates for the scholarships are Herbert S. Pahren, Cincinnati, and Arthur Marthens, Paul O. Laugguth and Andrew P. Lesniak, East Pittsburgh, Pa.

New Fire Pump has Motor and Engine Drive

A pump equipped with double drive, each unit of which depends on a separate source of power, is shown in the accompanying illustration. Double drive for a fire pump is always desirable and in some states is required by underwriters' regulations. The usual form of drive consists of a steam engine and electric motor, or where two separate sources of current are available, two motors are used.

The pump illustrated has a capacity of 1500 gallons per minute and is manufactured by the Lea-Courtney Co., Newark, N. J. The pump is coupled at the left to a 140-horsepower gasoline engine and at the right to a 150-horsepower alternating current motor made by the Westinghouse Electric & Mfg. Co., Pittsburgh.

Builds New Screw Cutting Bench Lathe

The tool shown in the accompanying illustration is a direct motor-driven bench lathe, recently developed by the Urban Machine & Tool Co., Cleveland. The head stock encloses all moving parts, including the driving motor. The gears are alloy steel, heat treated, and run submerged in oil. The spindle is carbon steel, finished by grinding to insure accuracy. End thrust is supported by radial thrust bearings.

The bed, which is cylindrical, is finished by grinding and is equipped with a hardened and ground takeup gib. The tail stock is of heavy design and fits over the bed, a feature, which it is claimed permits of rigid clamping. The tails tock may be set over for taper turning.

The carriage, which also travels over the cylindrical bed and is ground internally has a wearing surface. This tends to reduce chattering. The compound rest is equipped with taper gibs and graduations are provided for readily setting it at any angle. The longitudinal motion of the carriage is easily controlled and can be stopped instantly by throwing out the clutch lever on the head stock.

The lead screw with a ¾ x 10 acme thread is inside of the bed and therefore is protected from chips and dirt. The change gears permit the cutting of standard threads from 8 to 64, including 11½. The lathe weighs approximately 200 pounds and is a self-contained unit.

The Bethlehem Steel Co. has placed two blast furnaces in operation last week; one stack at Lebanon is making foundry, the other at Sparrows Point, is making basic. The Topton furnace, of the Empire Steel & Iron Co. has gone in on foundry iron. The Temple, Pa., stack may resume soon on foundry iron.

Schwab States Steel Is Industry's King

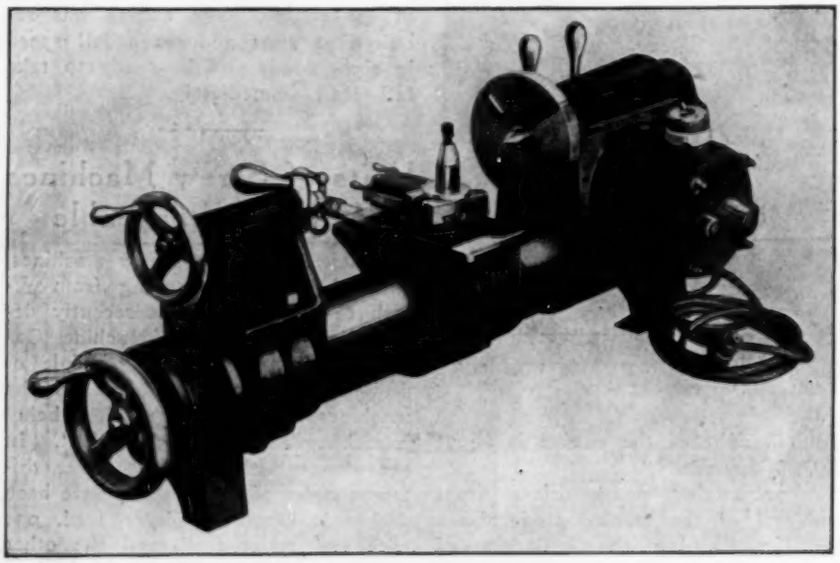
That normal conditions will not prevail until the country has gone through a greater crisis than that brought about by present labor conditions, is the opinion of Charles M. Schwab, chairman of the Bethlehem Steel Corp., according to an interview given by him at Pittsburgh, where he attended the Carnegie memorial services at the Carnegie institute.

"Steel is industry's king at present," Mr. Schwab is quoted as saying. "Cotton had its day. Wheat had its day. It's steel now. Steel is greater than any other single thing. This year there will be a production of 40,000,000 tons, which will produce a greater revenue than the corn crop."

Several subjects, including labor unrest, the peace treaty, international trade, etc., all vital questions of the hour were discussed by Mr. Schwab. At the memorail services he paid a tribute to the life and character of Andrew Carnegie.

Takes Over Shop

The Jones Structural Steel Co., Ravenna, O., has been incorporated to take over the business of the former partnership of Jones Bros., and improvements will be made at the plant which is equipped for fabricating structural steel. J. A. Jones, formerly of the Alliance Structural Steel Co., is president, and G. G. Jones, formerly of the Penn Bridge Co., Beaver Falls, Pa., is vice president. B. F. Jones is secretary.



SELF-CONTAINED BENCH LATHE WITH CYLINDRICAL BED

Industry Backs Coal Proposal

Manufacturers Urge Government to Stand Firm in Attitude Toward Unreasonable Demands of Miners Notwithstanding Probability of a Curtailment of Operations —Railroad Administration May be Obliged to Curtail Priority List

WASHINGTON, Dec. 2.—With the production of coal at a low ebb, one month after the strike was begun, the government is standing firmly behind its rejected proposal for a 14 per cent increase in wages, made through Fuel Administrator Harry A. Garfield last Wednesday night. That it intends to remain steadfast has been made plain in emphatic terms by Dr. Garfield. He is supported not alone by the government, which is prepared to exert all its powers to break the strike, but also by the great consuming public, including many manufacturing interests. Telegrams and letters coming to the fuel administration from these interests say that, rather than pay any more for their coal, or to have the government yield to the miners, they prefer to close down. That widespread closing down of industries, especially in the Middle West, is imminent unless quick relief in the way of supplies is afforded, is evident from messages also received by the administration, both from government sources and from private manufacturers. Despite this the latter have approved the government's position and are ready to see that it is vindicated at whatever sacrifice and suffering may be necessary. To do otherwise, it is recognized, is to concede the utter failure of organized government and the domination of a relatively few radical labor leaders. Such a condition, it is pointed out, inevitably would lead to chaos sooner or later.

While miners have not returned to work freely, some have drifted back, receiving the 14 per cent increase in wages, which operators through notices posted at the mines, said they would pay in accordance with their acceptance of the government proposal. It is confidently believed that there will be a progressive increase in the number of workers who return inasmuch as they have been officially advised through both Fuel Administrator Garfield and Assistant Attorney General C. B. Ames that they will be protected. To do this troops will be sent wherever and whenever needed by the war department. The department of justice is also prepared to take any legal action that is necessary and will obtain injunctions or take other courses to prevent strikers and union officials from interfering with production. Moreover, where operators may show any inclination not to open their mines, they will be seized by the government, Mr. Garfield has stated; but it is not believed this plan will have to be resorted to, unless it be in isolated cases. A number of mines are closed at present, but not through the action of operators, but because of the failure of miners to return to work. The operators plainly are not satisfied with the proposal of the government, inasmuch as they are to afford the entire 14 per cent increase in wages, but nevertheless they have accepted the suggestion and, with perhaps few exceptions, are cooperating fully with the government. Labor leaders, including Acting President John L. Lewis, whose scornful rejection of the government plan was made immediately after Dr. Garfield read it, continue to defy the government, but whether or not any action will be taken against them under present conditions remains to be seen.

Work on Best Distribution

With the alarming shortage of coal, and the comparatively small production existing, government officials are devising means to work out a solution that at least will afford a minimum of the requirements to prevent an industrial calamity and widespread suffering by the people. It is considered probable that the railroad administration, unless quick further improvement is made in mine operations, will resort to curtailment of the priority list, and cut off supplies entirely from so-called nonessential industries, although actually there are no such industries. Obviously this would cause idleness of many workers and it is said that the iron and steel industry may be one of the heavy sufferers through this reported plan.

While these suggestions looking to conservation of coal may be adopted, and workers may return in increasing number, appreciable relief is not expected without considerable suffering. Acting President Lewis and other officials of the United Mine Workers apparently are determined to do nothing to have strikers resume work. However, hope is seen in the fact that the government, through the injunction granted by Judge Anderson, has tied up the benefit funds of the miners, and after they have missed a pay day or so, it is thought many of them will be ready to return to work. It is held to be certain that they will not be able to obtain credit for living necessities long in the absence of being at work, and should any attempt be made from an organized source to give benefits to the miners this would be construed as part of the conspiracy charged by the department of justice and be punished accordingly.

The miners, after bombastic claims that a 40 per cent increase in wages was the "irreducible minimum," stood ready to accept the suggestion of Secretary of Labor William B. Wilson, who holds cards of membership in the miners' union, that they be granted an increase of 31.6 per cent. When Dr. Garfield and members of the cabinet refused to accede to this proposal, Lewis and other union officials protested that the government had repudiated its word. This, of course, was not so. Secretary Wilson, who has been bitterly criticised for the favoritism he has shown to the miners, merely was a mediator and conciliator, as Dr. Garfield stated before the meeting of operators and miners when he announced the proposed 14 per cent increase. Dr. Garfield said that, according to his figures, gathered from the bureau of statistics, department of labor, the federal trade commission and the railroad administration, it would take an average increase of 14 per cent to bring the scale of the miners up to the highest figured increased cost of living and no one has yet been able to dispute his figures.

Lewis returned to Indianapolis last Friday night after conferences on that day with Secretary Wilson and President Samuel Gompers of the American Federation of Labor, and said that he had arranged with Gompers to have the federation's lawyers assist counsel for the miners in their appeal from the ruling of Judge Anderson demanding cancellation of the strike order. Gompers issued a statement purporting to describe the interview with Lewis and said the award of 14 per cent increase had been discussed, Lewis declaring it would not be accepted. After conferring with Secretary Wilson, Lewis said: "Dr. Garfield represents the government Mr. Wilson told me that." Previously Lewis and other union leaders pretended to believe that Mr. Wilson represented the government.

A meeting is to be held here Wednesday by the operators' wage scale committee to determine details to preserve the existing differentials in putting the 14 per cent wage advance into effect.

In view of the defiant attitude of

the miners, doubt is expressed that they will approve the recommendation of Dr. Garfield that the government create a permanent consultative body, with purely advisory powers, consisting of the secretary of the interior as chairman and of an equal number of representatives of the operators and mine workers. Provision would be made for collecting definite and trustworthy data concerning the coal and coke industry as to production, cost, distribution, cost of living in different districts, selling prices and export requirements. While the miners could not conceivably oppose the plan on logical grounds, their attitude indicates that they would not accept it at this time simply because it was proposed by Dr. Garfield, if for no other reason. Nevertheless congress may act upon the suggestion.

Government Issues Huge Machinery List

WASHINGTON, Dec. 2.—The machine tool section, office of the director of sales, war department, has prepared and is distributing comprehensive bulletins listing approximately 2500 machine tools, valued at about $4,000,000, which are being offered for sale. The tools are listed according to their class, type, size and maker, together with the address of the district offices having the tools for sale where copies of the bulletins are obtainable. A brief description of each tool is given, including its "service condition." The bulletins will be revised from time to time, and issued every 15 days, as sales are made or as additional machines are declared surplus.

The tools listed consist of boring, broaching, centering, cutting off and drilling machines, furnaces, gear cutting machines, grinders, hammers, milling machines, pipe machines, planers, presses, riveters, screw machines, shapers, sheet metal machines, slotters, small tools, lathes, nailing machines, routing machines, trimmers, shop equipment, single purpose and special machines and miscellaneous machines.

The information carried in the bulletins, it is announced, has been obtained from the best sources available. The government invites inspection before purchase and assumes no responsibility as to condition or completeness of machines. The service condition is an approximate rating subject to change from further detailed information or inspection. All prices are subject to change without notice, f.o.b. cars, point of location and all machines and equipment are listed subject to prior sale. Prospective buyers are requested to communicate with their nearest bureau and district office.

Tools for Schools Omitted

None of the tools listed include those which are to be disposed of by the government to educational institutions, as provided in recently enacted legislation. The equipment to be sold to the schools, upon a basis of 15 per cent of their original cost, soon will be inventoried and a list prepared with an announcement as to their location and plans for their disposal.

Copies of bulletins issued and to be issued may be secured from the following various district offices:

AIR SERVICE—MATERIALS DISPOSAL BRANCH

811 Little building, Boston.
2050 Elmwood avenue, Buffalo.
230 East Ohio St., Chicago.
Care Maxwell Motor Co., East First street and Baltimore & Ohio railroad, Dayton, O.
Care aviation general supply depot, Springwells, Detroit.
Postal Telegraph building, San Francisco.
360 Madison avenue, New York City.

ORDNANCE SALVAGE BOARD, COMMISSION ON SALE OF BUILDING AND EQUIPMENT

Columbia avenue and Baltimore & Ohio railroad, Baltimore.
19 Portland street, Boston.
945 Main street, Bridgeport, Conn.
Seventy-fourth and Ashland avenue, Chicago.
Walsh building, Third and Vine streets, Cincinnati.
Twenty-second and Prospect avenue, Cleveland.
35 Washington boulevard, Detroit.
1107 Broadway, New York City.
1710 Market street, Philadelphia.
Fortieth and Butler streets, Pittsburgh.
82 North St. Paul street, Rochester, N. Y.
Missouri State Life building, St. Louis.
Room 21, 43 Victoria street, Toronto, Ont.

MACHINE AND ENGINEER MATERIAL SECTION, SURPLUS PROPERTY

Transportation building, Atlanta, Ga.
Coca Cola building, Baltimore.
108 Massachusetts avenue, Boston.
1819 West Thirty-ninth street, Chicago.
Jeffersonville, Ind.
461 Eighth avenue, New York City.
Audubon building, New Orleans.
Omaha, Nebr.
Twenty-first street and Oregon avenue, Philadelphia.
Second and Arsenal streets, St. Louis.
Fort Mason, San Francisco.
San Antonio, Tex.
El Paso, Tex.

SIGNAL CORPS

Textile building, Boston.
Army building, 230 East Ohio street, Chicago.
8-10 Bridge street, New York City.

Navy Tells of Its Price-Fixing Methods

WASHINGTON, Dec. 2.—How the navy department is able to carry minimum stocks of materials at the various navy yards is explained by Rear Admiral Samuel McGowan, paymaster general of the navy and chief of the bureau of supplies and accounts, in his annual report to Secretary Daniels. His report also summarizes the situation as to the sale and disposition of surplus material, that of canceled contracts and the use by the navy of its commandeering powers after the signing of the armistice.

Navy yards were well stocked with materials when the war demands disappeared with the signing of the armistice, Admiral McGowan said. In order that these might be used and further purchases be kept at a minimum, a system was adopted by which reports of all inactive and excess stocks are forwarded to the bureau of supplies and accounts. Requirements submitted are checked against these stores and dispositions made where specifications permit. This clearing house method has, according to the bureau chief, resulted in the interbureau exchange of $7,312,296 worth of material from the signing of the armistice to June 30, last. In addition, cancellation of contracts for materials worth $3,845,279 was ordered as a result of this system.

Due to standardization of material to a large extent many items are being eliminated in yard stocks, resulting in considerable reductions in the money tied up in material, the admiral reported. In order, however, that stocks will not be too scanty or too great under this plan, minimum and maximum quantities are being established at the navy yards covering the different items of material carried in the naval supply account. While not noted in the admiral's report it may be said this system has won the admiration of officials in other government departments and, as stated in the report, the navy is in constant touch with other departments, particularly the Emergency Fleet corporation, with a view to their utilizing navy stocks and vice versa.

Since the signing of the armistice sales of navy surplus materials have aggregated $20,500,000. The report says:

"Paralleling the customary navy procedure in the purchase of supplies, every effort is made in connection with sales to obtain the widest possible competition by advertising." The recovery here, however, is second only to that achieved in the canceling of contracts. This method saved the government $23,800,000, the admiral reported. On these cancellations the navy paid $3,200,000 "to cover raw and partly finished material and special tools taken over by the government overhead expenses, decline in market price or difference between cost and salvage value of material retained by contractors, machinery and buildings taken over or amortized by the government and profit allowed on work in process."

"In making the settlements for damages for the cancellation or partial cancellation of contracts," the report said, "the navy has allowed the actual cost to the contractor on the canceled portion, plus a fair profit on any work done on that portion, but no profit was allowed on the unperformed portion of the contract."

There has been considerable criticism of the navy for its continued use of war powers, particularly those of commandeering, in the months following the cessation of hostilities. In discussing this Admiral McGowan said:

"Although the navy commandeering powers were in nowise curtailed by the cessation of hostilities, it was thought that the navy should lend its influence toward the resumption of normal business conditions, and accordingly navy orders have since been issued as a last resort and only when it appeared that real competition is lacking and that unfair prices are being demanded.

"Prompt steps were taken to effect final settlement of all outstanding navy orders before the detachment of the commodity specialists who were conversant with the details of each transaction. Final prices were fixed only after exhaustive investigation of the costs and other conditions. Out of 6200 navy orders issued 339 now await final price fixing and in most of these cases delay is due to causes beyond the control of the navy. It is estimated that not more than 10 cases of price fixing by the navy will require final adjudication in the court of claims."

Why Brokers Were Barred

Concerning the elimination of brokers the report said:

"During the period of the war, the activities of brokers, commission men and contingent fee agents were curtailed to a minimum due to government regulation of industries and other causes. The navy was especially free from their importunities, owing to the fact that firms of this nature had not been placed on the mailing lists for many years past and there remained only a small number of them on the navy lists at the outbreak of the war.

"Of the latter, many were debarred during the period of the war for default in delivery and other causes, including attempted fraud. Following the armistice, however, the few remaning brokers on the mailing lists immediately submitted bids in large numbers and covering all kinds of supplies. At one opening a considerable percentage of the bids was from these concerns.

"It was obvious that the acceptance of such bids would result in an intolerable condition wherein a few firms of this sort, owing to their being the only brokers on our lists, would be in the position of having a preference over other firms of the same character. Further, such a condition would tend to destroy the confidence and prestige which the navy had earned among reliable and legitimate contracting concerns in all lines of industry.

"The navy, therefore, refused to accept any further bids from such agencies and eliminated all of them from the bidding lists, thereby complying implicitly with the plainly mandatory requirements of section 3722 of the revised statutes that 'No person shall be received as a contractor who is not a manufacturer of, or regular dealer in, the articles which he offers to supply.' Following this action, persistent efforts were made by these brokers, agents, etc., to be restored to their former status as bidders, their principal argument being based on the interpretation under the statute of the term 'regular dealer'."

Country's Industry Great War Factors

WASHINGTON, Dec. 3.—The smoke of American factories, reaching from the Atlantic to the Pacific, contributed as much to the defeat of the Germans as force of our blows on the Marne and Meuse.

This point is made by Maj. Gen. William J. Snow, chief of field artillery, in his annual report made public today. The co-ordination of the output of guns and material, with the development of artillery units fell on the office of the chief of field artillery. At first, it is pointed out, to further the ends of training, this consisted of a redistribution of the scant material on hand; later it developed into not only supplying all our combatant troops in France and America with the necessary equipment and reserve, but in following up closely all improvements and inventions in ordnance and equipment.

During the early part of 1918, General Snow states, the material output dragged woefully behind the training of the personnel, but as the year drew to a close these two great factors for the successful conclusion of the war drew abreast, forcing Germany, as much as any one thing, to sue for an early peace.

The report, like those from other branches of the war department, however, takes occasion to sound warning against the United States ever again being caught utterly unprepared in material for war, and it reviews the condition at the entrance of this country into the war in its negligible supplies, the pathetic makeshifts, such as wooden guns, used to train soldiers, and the lack of accomplishments even up to the time of the armistice.

In the list of recommendations made, General Snow says:

"It is indispensable that an adequate reserve of material and equipment, particularly of ordnance, for our needs upon the outbreak of war be accumulated and maintained in time of peace. Had we not been able to obtain ordnance from the French and the British we would have been a negligible factor in the war until the end of 1918. When the armistice went into effect, 19 months after we entered the struggle, with the exception of 24 eight-inch howitzers made from British plans by the Midvale Steel & Ordnance Co., we had in line not one single piece of divisional, corps, or army artillery manufactured in America after our entry into the war."

The report also recommends that the development of the motorization of artillery of all calibers, including that of caterpillar mounts, be pushed energetically.

The question of material is declared to have been a most serious one and its lack has had a highly injurious effect upon the efficiency of the divisional artillery. The French government was to completely equip the American divisional artillery until such time as American material could be manufactured and shipped. This material consisted of artillery, 75-millimeter guns, 155-millimeter howitzers, vehicles and fire-control equipment. Although the first brigade was promptly and completely equipped, various causes made it difficult to provide the necessary equipment, especially as regards the 155-millimeter howitzers and limbers, fire-control equipment and horses. In many of the 155-millimeter howitzer regiments not even guns were available in sufficient numbers for purposes of instruction. During nearly the entire training period of the regiments after Aug. 1, 1918, there were available but four howitzers for the use of the entire regiment.

"One of the great lessons that our people should learn from this war is that it requires much time to

manufacture guns," it is stated. "* * * Had it not been for the material furnished us by the French and the British, it is believed that the war would have been lost."

General Snow says that while the facts as to shortage are as stated, he does not wish to leave the impression that the ordnance department was negligent in providing. It takes months to make a gun and carriage, it is explained, and the facilities for accomplishing this on a quantity-production scale, such as was needed in this war, did not exist in this country.

"Plants for this purpose had to be created from the ground up—the buildings had to be erected, the machinery for installation had to be manufactured, the skilled personnel had to be gathered together, the factory organization created, etc.," General Snow says. "It is a monument to American genius that we did as well as we did. Nevertheless the fact still remains that there was this tremendous shortage, and it rendered doubly hard the task of training the field artillery."

The field artillery, it is declared, suffered far greater than any other arm of the service the lack of equipment absolutely essential in the training of its units. On March 31, 1917, one week before the declaration of war, material for the training of field artillery units in the United States consisted of only 930 pieces, ranging from 2.95-inch mountain guns and howitzers to 6-inch howitzers. On April 1, 1919, production had reached the following figures: 1281 75-millimeter guns, 33 3-inch guns, 395 4.7-inch guns, 334 155-millimeter guns, 521 155-millimeter howitzers, 213 8-inch howitzers and one 9.2-inch howitzer.

Speaking of the lack of material for training purposes, General Snow says at one point:

"Entire brigades were furnished with from one to four guns for the training of the entire unit, with other necessary material distributed in like proportion. Wooden guns were improvised as were radio and telephone sets. Ingenuity was displayed in the construction of sights, scales, trench mortars, and fire-control equipment, but these improvizations in no way made up for the deficiencies in material which threatened at all times to limit the efficiency of these units."

General Snow adds that "the efficiency of the new units may be attributed to the guiding hand of the few regular officers, to the magnificent spirit and earnestness of the newly-commissioned officers from civil life, and to the interest, 'pep', intelligence, and business-like seriousness of the drafted men."

English Steel Industry Becomes More Active

Washington, Dec. 2.—The first two weeks of November showed a tremendous increase in new orders in English iron and steel industry, particularly for foreign countries, according to Wilbur J. Page, American trade commissioner at London, in a report to the department of commerce. Many manufacturers, he said, have had to refuse sufficient business to keep their mills running full capacity and as a result of this most merchants are able to dictate terms of settlement for foreign orders. The usual procedure is payment against document, he reported.

"Users of American billets are complaining about the slow delivery owing to shipping difficulties," Mr. Page wrote. "In many cases they are placing orders locally for bars, puddle bars, gas strip, etc. If United States producers could only increase production and assure reasonable delivery orders for billets and bars would be placed in large quantities in spite of the adverse rate of exchange."

One English concern was reported ready to place business here for 20,000 tons if there was any likelihood of getting reasonable delivery. In Staffordshire many of the re-rolling mills were hard pressed for material and as a result several of the mills were idle except for such small lots of stock as they were able to purchase from government supplies held over from the war.

Since the close of the strike in Wales, Welsh mills have been flooded with orders, Mr. Page said, but the largest of these has not yet started its blast furnaces and there was no prospect of making deliveries short of the New Year. Producers of billets have advanced their prices well over £15 5s. One firm in South Wales was offering a small lot of billets at £15 15s which represents an advance of 7s 6d on previous quotations.

"The molders' strike has now lasted so long that its effect is being made manifest on the iron and steel trade," continued Mr. Page. "It is becoming more and more difficult to effect renewals on plants and repairs. New machine equipment, especially rolls, are almost unobtainable."

English merchants and manufacturers recently reported an improvement in inquiries for high speed steel. This, Mr. Page interpreted, is an indication that the stocks accumulated by the British government for war purposes have become somewhat depleted, although there are considerable government stocks still left. Some sizable foreign orders for high speed steel recently were accepted, he said.

The call for tungsten has also shown a decided improvement and carbon crucible steel can only be said to be in fair demand. The shortage of ferrovanadium was reflected in a recent advance price to 30s per pound. Ferrochrome and ferrosilicon were in abundant supply with demands quiet. Ferrosilicon of 45 per cent quality was quoted at £18 per gross ton.

War Liquidation About Four-Fifths Done

Washington, Dec. 2.—To Nov. 2, a total of 27,923 war department contracts valued at $3,868,417,000 had been reported suspended, as compared with 27,752 suspended contracts valued at $3,877,095,000 reported the preceding week. These changes are due to corrected reports.

The present status of contract liquidation is as follows:

	Number	Value
Total suspended	27,923	$3,868,417,000
Total liquidated	22,804	2,106,738,000
Per cent liquidated of total suspended	81.7	54.5

On the 22,804 contracts liquidated, the saving effected was $1,857,095,000. It cost $249,643,000 to secure the relinquishment of these contracts. In addition, partial payments in liquidation on other contracts amounted to $85,838,000, making a total of $335,481,000 paid in liquidation to Nov. 8.

The present status of contract saving is as follows:

Value of contracts liquidated	$2,106,738,000
Saving effected	1,857,095,000
Per cent saving effected	88.2

There are 5119 contracts remaining to be liquidated. Of these, the value of 2211 is known and amounts to $1,761,679,000. Assuming that future liquidation in each bureau can be effected at the same rate of cost as has obtained in the past, the cost of liquidating these contracts may be estimated at $224,496,000.

Lifts Pig Iron Ban

Washington, Dec. 2.—Pig iron has been removed from the British export embargo list, according to a cable under date of Nov. 22 from Consul General Hollis at London, to the bureau of foreign and domestic commerce.

The S. F. Bowser Pump & Tank Co., Ft. Wayne, Ind., has purchased the plant of the Menefee Foundry Co., that city. The Menefee company has made castings for the Bowser company for the past 30 years.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

HENRY PENTON, Great Lakes district manager for the Emergency Fleet corporation, resigned Nov. 30, his war work having been completed. Mr. Penton is the only district executive of the 12 appointed in August, 1917, who remained from start to finish, and with his associates he has left a record of great accomplishment. The first vessel requisitioned for the government was delivered from the Cleveland or Great Lakes district, as was also the first vessel built under direct contract with the Emergency Fleet corporation. Great Lakes builders already have delivered one-fourth of the total number of merchant vessels contemplated by the corporation for the entire United States. In the 27 months prior to Nov. 30, the Great Lakes district completed and sent to sea 374 cargo vessels of 1,396,890 tons, total deadweight tonnage, and 30 tugs. On its contracts, 54 cargo ships and 18 tugs remain to be delivered from the Cleveland district, all of which will be ready for the opening of navigation in 1920.

Mr. Penton's eminent success as district executive for the Emergency Fleet corporation, doubtless can be accredited to his many years of training as a naval architect, marine engineer and practical shipbuilder. Before the war he had spent many years in executive positions with various shipyards around the Great Lakes. and was a designer and builder of high standing. His familiarity with shipbuilding problems from an executive standpoint fitted him especially to expedite the government's effort in connection with shipbuilding on the lakes during the war.

For many years he was a member of the firm of Babcock & Penton, New York and Cleveland, marine architects.

In a statement to his staff upon his resignation, Mr. Penton said:

Without your assistance and co-operation the enviable record and unique standing of the Great Lakes district would have been utterly impossible. The elder members of this force have taken part in a performance which stands without a parallel in history. I do not think it is too much to say that without the assistance of the Great Lakes district and the revelation of its resources the outcome of the war might have been very different.

Of the efforts of the builders, Mr. Penton made the following statement:

The builders of the Great Lakes showed the stuff they are made of, by expanding their capacity to meet the national need, even during the stress of war times, almost without governmental assistance. Out of over $225,000,000 advanced by the Emergency Fleet corporation for shipyard construction and expansion, less than $2,225,000 came to the Great Lakes. The builders in this district demonstrated beyond a doubt that but for canal limitations between the lakes and seaboard the shipping center of the United States would be on the Great Lakes. The lake yards outpointed the rest of the country at every stage; speed of construction, riveting output, tonnage per man, number of ships per berth, cost of supervision and other details. One yard, with only three berths, delivered 14 completed 4200-ton ships in the past 11 months. Others were not far behind.

HENRY PENTON

M. P. Emmerich has been made purchasing agent of the Duquesne Steel Foundry Co., Pittsburgh and Coraopolis, Pa., to succeed J. G. Hallas, resigned.

Edward F. Sise recently resigned as president of the Northern Electric Co., Montreal. In 1890 Mr. Sise organized the Wire & Cable Co., of which he was managing director until its amalgamation with the Northern Electric Co., at which time he became president of that company. He is succeeded by Paul F. Sise.

J. H. Nead now is metallurgist for the American Rolling Mill Co., Middletown, O., having served as captain in the ordnance department in this country and in France, during the recent war.

William H. Haywood, formerly associated with the Youngstown Sheet & Tube Co., Youngstown, O., in its sales department, has accepted a position with the Youngstown Boiler & Tank Co., that city.

Herbert Du Puy, who recently retired as chairman of the Crucible Steel Co. of America, following a serious surgical operation at the French hospital, New York, again was operated on there, Nov. 26. Following the operation, it was said that Mr. Du Puy's condition was regarded as encouraging.

William S. Boyd, who has been for a number of years purchasing agent of the Page Steel & Wire Co., Monessen, Pa., has severed his connection with that company to become manager of the steel and iron scrap department of the Thomas D. Prosser Co. Mr. Body's headquarters will be at the main office, Wooster, O.

B. Frank Hiestand has been elected vice president of the Pulaski Iron Co., Real Estate building, Philadelphia, taking the place of W. H. Gibbons, who resigned. Mr. Hiestand has been identified with the Marietta Casting Co., Marietta, Pa., and is connected with a number of enterprises in that city. Harry C. Griefzau has been made secretary and treasurer of the Pulaski Iron Co., succeeding Mr. Gibbons who also held these offices. Mr. Griefzau has been connected with the Pulaski company for 12 years. N. G. Kamerer has been made assistant secretary and treasurer, succeeding Mr. Griefzau. The company's blast furnace, coal mines and coke ovens are located at Pulaski, Va.

Men of the Machinery Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

FREDERICK W. SINRAM, who recently was elected president of the Van Dorn & Dutton Co., Cleveland, specialist in gears and gear cutting, has been acting head of the company with the title of vice president since the death of H. H. Hodell, about two years ago. This recognition of his services comes after a period of nine years of service with the company, which began in 1910 when he was made secretary and manager of sales. In 1911 when Mr. Dutton resigned from the company, Mr. Sinram was elected treasurer, retaining the duties of secretary. He also is treasurer of the Van Dorn Electric Tool Co., and since its organization about three years ago, has been president of the American Gear Manufacturers' association. T. B. Van Dorn one time vice president of the Van Dorn & Dutton Co., now becomes chairman of the board and Franklin Schneider, who formerly was factory manager, has been elected vice president. Mr. Schneider also is president of the Van Dorn Electric Tool Co. The present treasurer of the Van Dorn & Dutton Co. is F. G. Hodell.

J. Franklin Fort resigned as chairman of the federal trade commission, Washington, Dec. 1, because of ill health. He formerly was governor of New Jersey.

George F. Fuller, president and treasurer of the Wyman-Gordon Co., Worcester, Mass., and Cleveland, has been elected president of the Worcester Country club.

D. J. Burns, with headquarters at 1340 East Ninety-first street, Cleveland, has been appointed Ohio sales representative of the Miller Saw-Trimmer Co., Pittsburgh.

C. G. Ugguas has been appointed assistant chief engineer of the Cleveland Machine & Mfg. Co., Cleveland. Mr. Ugguas formerly was identified with the Youngstown Sheet & Tube Co., Youngstown, O., in the drafting department.

A. E. Nordwall has been placed in charge of the branch office established at 201 Maynard building, Seattle, by the Black & Decker Mfg. Co., Towson Heights, Baltimore. Mr. Nordwall will have charge of the distribution of the company's products, namely portable electric tools, etc., in the state of Washington, under the direction of the main Pacific coast office, 918 Hearst building, San Francisco.

W. J. Riley recently resigned as buyer of machinery and tools, etc., for the Covert Gear Co., Lockport, N. Y., to become efficiency engineer for the Dittmer Gear & Mfg. Co., that city.

F. W. SINRAM

Oakley S. Walker, head of the O. S. Walker Co., Worcester, Mass., manufacturer of grinding machines and magnetic chucks, retired from business upon the reorganization of the company recently. Mr. Walker is the inventor of the magnetic chuck and of many other machine parts. He organized the O. S. Walker Co.

J. A. Tarkington, superintendent and consulting engineer of the Kissel Motor Car Co., Hartford, Wis., will leave the company on Jan. 1 to become directing head of the Tarkington Motor Car Co., organized at Rockford, Ill., to manufacture passenger automobiles. Mr. Tarkington has been connected with the Kissel company for nearly 14 years.

Frank H. Willard, assistant general manager of the Graton & Knight Mfg. Co., Worcester, Mass., has been elected general manager and vice president of the company. Mr. Willard became affiliated with the Graton & Knight company in 1882. Since then he has held successively the positions of foreman, superintendent and assistant general manager.

Matthew Finn is no longer treasurer of the Federal Tool Co., 453 Michigan avenue, Detroit, manufacturer of precision tools, the duties of that office being combined with those of the secretary, Thomas T. Tierney. At the recent reorganization meeting, Victor Fabry was elected vice president. J. Larkins remains as president.

Francis J. Reilly, formerly with the Brown & Sharpe Mfg. Co., Providence, R. I., and later with the service departments of *Machinery* and *Railway Mechanical Engineer*, New York, has been appointed assistant advertising manager of the Norton Co., Worcester, Mass., to succeed Russell S. Coe, resigned. During the war Mr. Reilly was with the United States aircraft production board.

W. E. Seymour, of Beloit, Wis., has become associated with the A. O. Smith Corp., Milwaukee, as vice president and general manager. Mr. Seymour for six years has been general superintendent of the Eclipse works of Fairbanks, Morse & Co., at Beloit, previously having been with the Ford, Cadillac and Buick automobile factories and later going to the Fairbanks-Morse works at Three Rivers, Mich. He goes to the Milwaukee company to take charge of the enlargement of its works at a cost of more than $3,350,000, the first unit of which, 160 x 740 feet, is now being completed. Contracts for a second unit will be awarded shortly. The Smith company ranks as the largest producer in the world of pressed steel automobile frames and furnishes some of the largest makers of cars and trucks with pressed, forged and stamped parts. Before retiring from the Fairbanks-Morse organization, Mr. Seymour completed plans for a new $1,500,000 gray iron foundry with a capacity of 400 tons a day with eight cupolas. This will be built early next year.

Trade Pouring in on Germany

Iron and Steel Companies Making Remarkable Recovery, Although Profits Are Being Sacrificed—British Makers Demanding Protection Against "Dumping"—Lifting of Import Restrictions Disastrous for Some Concerns

European Headquarters,
THE IRON TRADE REVIEW,
16 Regent Street, S. W. 1.,
London, Nov. 20, 1919.

THE German *Frankfurter Zeitung* makes a remarkable boast as to the ability of Germany to dump her materials abroad at prices below her competitors. It says:

"As the present low exchange of the reichmark is operating as an export medium of the heaviest kind, German wares are in a position to force their way in foreign markets with ease, and at prices which will yield the German producers and exporters large profits, while creating for foreign producers the most serious, sometimes even an intolerable competition."

This statement hardly is justified by the facts, and there is some evidence that although the iron and steel companies are showing a remarkable recovery in output, they are feeling severely the financial strain. With regard to German production, the low water mark was reached in February last when the output of pig iron fell to 469,000 tons as compared with 892,788 tons in February, 1918, and 1,494,000 tons in February, 1913. But after February, 1919, the output increased steadily to July, when it reached 576,000 tons. The total output of pig iron in Germany in the first eight months of the year was 4,140,000 tons, as against 7,460,000 tons in the same months of 1918, and 11,220,000 tons in the same months of 1913. For the ten months, Germany's output was 5,160,000 tons.

Nominal prices of iron and steel products and coal in Germany are rapidly rising. On Oct. 1 prices of iron were raised by various amounts, ranging between 112 and 162 marks per ton. The German Stahlwerksverband has just added 250 marks a ton to its price for mine rails, making the present price 1050 marks a ton. On Oct. 7 300 marks per 1000 kilos were added to the cost of heavy rivets, and other rivets have been advanced 300 per cent. Generally, the finishing mills are adding from 300 to 400 per cent to their prices. Leading German manufacturers claim that Germany, taking exchange into account, remains the cheapest country in the world. It appears that prices of German pig iron are about ten times as high as in 1914. At present a ton of German hematite costs 735 marks, but taking exchange into account this represents an actual increase of only about 50 per cent, whereas in Sweden advances are from 100 to 200 per cent above the peace rate.

Apparently Germany is greatly elated over her prospects of international trade. "If Germany could produce steel sufficiently," says the *Handelstidning*, "she would wipe out all competitors." This paper points to the fact that the Solingen steelwares makers, all 25 of whom were represented at the Frankfurt fair, were besieged by English, Scandinavian, French and American buyers, and "could have sold ten times as many knives and scissors as they produce normally in 10 years." It so happens however, that Germany's productivity is limited, and, further prices have not stopped advancing. That is shown by the fact that nearly all the German steel and iron companies report vanishing profits for 1918-19. The Hohenlohe Co. made a profit of 6,000,000 marks last year, but this year lost that amount. Thyssen, of Muelheim, has had to suspend his 10 per cent dividend; the Hoesch Smelting Co., of Dortmund, reports a deficit of 17,600,000 marks; and the Dusseldorf Rhenish Steel Works, the Hasper Iron and Steel Works, and several minor industries report a slump in profits. All complain of high wages, coal prices, diminished output, and higher prices paid for Swedish ore. It follows that if Germany's iron and steel industry is not to suspend home prices must be put up still further, and she will ultimately lose most of her present advantage from the depreciated reichsmark exchange.

British competitors after carefully comparing German and British conditions are not greatly alarmed, although they are not disposed to ignore the possibility that Germany, following her old policy, will send out a lot of stuff at a very cheap rate, with the intention of raising her price afterwards.

* * *

"America Come to Stay"

George Carrington, president of the Staffordshire Iron and Steel institute, devoted a portion of his presidential address at the recent meeting to a consideration of the question of foreign competition, and especially that of America. He said the 8-hour system adopted in the Black country industry had not proved satisfactory.

The world's prewar iron and steel capacity was about 60,000,000 tons. It is now 80,000,000 tons, but whereas Germany was formerly second in the world's production with a capacity of about 19,000,000, or about three times the British tonnage, the war has reduced her to an equality with Great Britain and France. America had a prewar capacity of 45,000,000 tons, and with her natural resources, there is no reason why she should not more than double her present output. Present capacities, according to Mr. Carrington, are: America, 45,000,000; England, 11,000,000 to 12,000,000; Germany, 12,000,000 to 13,000,000.

"America and France," he said, "come to stay, and it will need long, continued, and persistent effort to retain the former high position of Great Britain. America's output is once more on the increase, and, in the words of Mr. Layton, the director of the National Federation of Iron and Steel Manufacturers, "by merely selling 10 per cent of her output into the markets of the world she can swamp Great Britain."

With regard to exports the British monthly average in 1913 was 411,000 tons as compared with America's 231,000 tons. Great Britain in June last exported 194,000 tons, while the American figure for March was 408,000 tons. Mr. Carrington pointed out that two countries had changed places.

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Prewar Contracts Defaulted

A number of interesting legal cases have arisen recently in Great Britain as a result of defaults on prewar contracts for raw material carrying low prices. In many cases the defendants reside in other countries and some delicate questions of jurisdiction are involved. One of the most important of these disputes, recently adjudicated before the lord chancellor, is the case of an English company operating a foundry at Leeds and a railway tire and axle plant at Manchester versus A. Johnson & Co., a Swedish concern doing business at Axmaz, near Stockholm, Sweden.

On May 23, 1908, A. Johnson & Co. contracted to furnish the English plaintiff with its requirements of Swedish pig iron from 1908 to 1920 inclusive, delivered at Leeds or Manchester for £4 17s 6d and £4 13s 9d

per ton, respectively (about $24 at then prevailing exchange). This was subsequently increased by agreement to £5 and £4 18s 3d. The defendant defaulted and has failed to present shipping documents or to forward any pig iron since 1916.

The decision was to the effect that since the arrangement was an ordinary c.i.f. contract, in the execution of which the tendering of shipping documents in England was a supplementary and not an independent proceedings, the British courts are without jurisdiction. This decision is of great practical importance to American exporters to Great Britain, since the rule of no jurisdiction has been laid down by the highest legal authority in the empire, and exporters have been constantly seeking to obtain judgments on the ground that the mere submission of shipping documents within British territory makes the sellers responsible to the British courts.

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New Syndicate Formed

A great syndicate has been established in Great Britain with a capital of £5,000,000, the object of which is to secure co-operative production between several kindred industries. At a meeting held in London in October, John Slater, who presided, said the syndicate is composed of producers of coal, and they have modern collieries fully equipped for profitable operation when the government relinquishes control. The representative of the pig iron interests in the syndicate, Mr. Whitwell, said it is now negotiating for certain steel works. It now has shipbuilding yards, but they are suffering from the lack of raw material.

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Appeal for Protection

A letter and memorandum have been sent to the British board of trade by the director of the Federation of British Industries. The main subject relates to the withdrawal without proper notice of restrictions on imports which action, it is claimed, has inflicted serious injury on certain industries. Instances are given of industries carefully nurtured during the war which have received a deadly blow. The government is asked to consider a series of industries which it already has declined to regard as "key industries entitled to special protection. Among these are the plants manufacturing steel balls and ball bearings, and producers of the ferroalloys, molybdenum, chrome and silicon, manufacturers of drop forgings and stampings, rolled steel wire rods, and wire nails. In addition it is pointed out that the bridge and structural iron works, marine engineering shops and iron and steel wire mills are particularly affected by the dumping of foreign goods.

Regarding competition through underpaid labor, the federation hopes that the work of the international labor bureau may lead to a clearer knowledge of the difference in wage costs in various countries. If steps can be taken by the countries in the league of nations to prevent goods produced by underpaid labor from being sold in other countries, much will be done to attain the object at which the league is aiming. This is of prime importance, the federation believes, since Great Britain seems now destined to rank permanently as a high-wage country.

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Britain Short of Cars

An official explanation has been given with regard to the serious shortage of British railroad cars. It is pointed out that during the war from 10,000 to 20,000 British cars were sent overseas, and have not yet been returned. From 30,000 to 40,000 private cars are out of use awaiting repairs, and this has caused an unprecedented demand on the railroad companies' cars, especially for conveyance of coal. In addition to this, there is an unusual output of manufactured goods, especially from firms who have changed over from war to peace production.

Several Factors Affect Fuel Shortage

European Headquarters,
THE IRON TRADE REVIEW,
16 Regent Street, S. W. 1.,
London, Nov. 20, 1919.

FROM the famous French coal mines of the Pas de Calais region, which were for four years in the zone of fire, water is now being pumped out at the rate of 1,000,000 cubic meters per 24 hours. Forty-five large pumping plants are in operation. This coal field is within the zone of operations of the British army and the British authorities still are giving all the assistance they can in the work of rehabilitating the mines. However, at least 20 shafts are still blocked and considerable time must elapse before coal shipments in any quantity can be expected.

These conditions, coupled with the failure of the Germans to deliver the quantities of coal and coke stipulated by the armistice, are aggravating the fuel shortage which has reduced many of northwestern Europe's iron and steel plants to a state of partial paralysis.

But little foundry pig iron is being produced in Lorraine at present owing to coke shortage, which is accentuated by the lack of railroad equipment, including both locomotives and cars. As a result, although 50 cargoes of coal arrived at French ports during the first week in November, largely from the United States, nearly 150,000 tons still are lying on the docks owing to lack of rolling stock. Therefore, unless the curtailment of production resulting from the American miner's strike extends for a long period, this disturbance will have little effect on the European fuel situation.

Labor difficulties are complicating the situation both in France and Belgium. In the coal mines at Briey 18,000 men now are employed, compared with 23,000 during the war. The daily production of this important group of mines is between 8000 and 9000 tons. The importation of Italian labor is being considered, to which the French miners strenuously object.

As cabled to THE IRON TRADE REVIEW today, the iron works at Roubaix and Tourcoing, just behind the old German lines in northern France, are shut down from lack of fuel. Bringing in coal by motor truck has been considered but rejected as being too expensive. What is wanted is a daily train of 400 tons from the Saar or Lorraine. The alternative is for 33 plants to remain closed or to operate in a limited fashion.

Every effort is being made to encourage the shipment of Saar and Lorraine coal to other districts, but Alsace-Lorraine with its consumption of 17,000,000 tons annually must first be supplied from these sources. The German mines now under French control can produce 13,900,000 tons annually, but in October German mines furnished France only 17,000 tons of coal and coke. Coal freight rates from Strassburg and the Saar to Nancy are 8.50 and 8.35 francs per ton respectively (about $1). The rate is satisfactory to the iron and steel interests but the tonnage is lacking.

Little Stories of Business Life

Saving His Job

ILLUSTRATIVE of the contention of steel plant officials that it is the unthinking rather than the thinking toiler who has gone out is the following story told about a couple of men of one of the plants of the American Sheet & Tin Plate Co.

Bill, who did remain at his work was accosted by Joe, who thought he had a grievance and stayed out.

"Bill," said Joe, "I understand you went to work today and that you took my job. Do you think that was a nice way to treat a fellow you've known as long as you have me?"

"We have been friends for a long time, Joe," said Bill, "and it is true that I went to work today, but I haven't taken your job; I'm holding it for you till you come back. I have stayed on the job because I want to help keep the old works going, so that when you and some of the other fellows who have not been using your heads, come to your senses and start looking for a job you'll have one to go to."

Joe reported for work the next day.

How It Works Out

THAT Judge Gary was proceeding along the right line in contending before the senate committee that no shop which recognizes the labor union can continue as an open shop is borne out by experience in a strike of fabricators in Chicago. Two policies had been followed by the shops, one class paying no attention to a man's union membership while the other saw to it that no union men were allowed to remain on the payroll. When the strike came the former class of employers found the number of union men in some cases was larger than they had thought, but regardless of the proportion the strike caused the entire shop to go out, nonunion men remaining away through fear. The only shops remaining active were those which had excluded organized labor. Not the least trouble was experienced by them and operation was not interrupted.

And It Rained Coke

WHEN the steel strike was called, and operations at a good many plants suspended, coke producers found themselves in a serious dilemma. Shipments of large tonnages of coke were held up by reason of the banking or blowing out of furnaces for which the coke was intended. In a good many cases the coke already had been loaded on cars, so that, in order to escape demurrage, the coke operators immediately began rustling up buyers of this coke for spot delivery at cutprices. One of these buyers was an eastern Pennsylvania pig iron maker who, needing the coke, and finding the price attractive, closed for a large block offered to him. He specified that the coke was to be shipped to his furnace at the rate of five cars per day, so as to enable him to unload conveniently. Either his stipulation was overlooked or it was ignored. The coke company had 43 loaded cars on its sidings and demurrage charges were accumulating. Hence it sent forward the 43 cars in one consignment. When the solid train of 43 cars was delivered to the furnace company, the latter refused to accept more than 20 cars, until it had been assured by the seller that the latter would take care of any demurrage charges that might develop.

"Many a True Word—?"

POSSESSED of an unusual amount of common sense, Vice President Marshall, nevertheless, has a sense of irrepressible Hoosier humor. While President Wilson was on his western tour, the President's "only vice," Mr. Marshall, as the latter once inscribed in a book he presented to the chief executive, went to the union station in Washington as acting chief magistrate to welcome General Pershing. As his automobile neared the entrance to the White House grounds, only used by the President and distinguished visitors, the Vice President remarked:

"Now we'll see if we can get into Gompers' annex."

Bacteria Form Iron

YEARS ago Pasteur revealed the significance and dealiness of bacteria in disease, and the function that they perform in fermentation. It has remained for living scientists to discover the extent to which bacteria are engaged in tearing down and building up the earth's crust. It recently has been demonstrated that bacteria not only aid in the decomposition of rocks and in the formation of beds of chalk and limestone, but it now is evident that they are active agents in the deposition of iron ore. For instance, it is learned that much of the trouble which occurs in the operation of city water supply systems is due to iron-depositing bacteria, which clog the pipes with hard, thick crusts, and slimy layers of rust which are composed of millions of bacteria.

E. C. Harder of the United States geological survey, who has examined deposits of iron ore in many countries for the special purpose of determining their mode of origin, has recently made close studies of the action of bacteria in forming iron ores. He has found the so-called iron bacteria actively engaged in the deposition of compounds of iron not only in surface iron-bearing waters

but in mine waters to depths of several hundred feet and has made laboratory cultures of various iron-depositing bacteria. Mr. Harder describes the iron-depositing bacteria, gives the results of his laboratory experiments in bacterial iron deposition, considers the probable extent of the influence of bacterial action in forming deposits of iron ore, and gives a bibliography containing the titles of many papers on the work of bacteria in rock and ore deposition.

Purpose vs Rapacity

IN THESE days of high cost of living, Senator William S. Kenyon, of Iowa, who was in charge of the steel strike investigation, recalls that when he started to practice law in Fort Dodge he allowed himself 20 cents a day for food, a dime about 10 o'clock in the morning for coffee and rye bread, and a dime for two fried eggs and more rye bread about 4 o'clock in the afternoon. The senator could not avoid thinking of those days of rigid economy when he heard steel workers tell of wages they are being paid which by no means restrict them to such a modest diet.

Using Pipe for Frames

A NEW market for standard steel pipe is being developed among manufacturers of automobile starting and lighting equipment. It has been found that this pipe, when cut into 6-inch lengths, serves more satisfactorily than many other materials for starting motor and generator frames. After being cut to the required length the pipe is accurately bored on the inside. Recently a prominent manufacturer of automobile starting equipment in Indiana purchased 4000 feet of 4½-inch pipe for this purpose.

Unbusinesslike Methods

AN ILLUMINATING illustration of the intricacies of the red tape that enfold the efforts of buyers to obtain machine tools on sale by the government has just come to light. A manufacturer has a straight-sided press on order for a user on which six weeks delivery was promised but this time has expired and the best promise now is February. The user needs the equipment and will place it at once in production. In the tools offered by the ordnance department at Chicago is one that fills the bill exactly.

A dealer seeking to obtain it for the user was asked to submit a bid, which must be 80 per cent of the market price. This bid is to be sent to Washington where it will be compared with the bureau's idea of what the price should be and eventually a decision will be made whether this buyer will be allowed to take the machine. Meanwhile it is being withheld from production.

A business concern under similar circumstances would have a price set on the tool so that the buyer could decide at once, the transaction could be completed and the tool shipped all on the same day.

Opportunity In Steel

THE *New York Globe* sends out a reporter every day to ask a certain definite question of five people whom he selects at random in public places. A few days ago the question that he put was "What business or profession affords the best opportunity for young men?" The reporter went to the Pennsylvania railroad station in New York and put the question to a steel man, a superintendent of stevedores, a tailor, an actor and a draftsman. Of these men, the actor selected the profession of electrical engineer, and the tailor that of lawyer. The superintendent of stevedores selected the steamship business and the draftsman the profession of engineer in the erection of big buildings. The steel man, who was J. C. Williams, vice president of the Weirton Steel Co., Weirton, W. Va., came out unqualifiedly for the steel industry.

"There is no better business today," he said, "for a young man than the steel business. We need young blood more and more but its possessors must start at the bottom. The great trouble with our young men today is that they want to start at the top."

Stimulus of Victory

C. S. KOCH, new president of the American Foundrymen's association, vouches for this strike story:

A Lancaster, Pa. jewelry man, returning home from a business trip to New York, found that a strike had been called during his absence. He asked the elevator man, who happened to be an Irishman, why the men had struck. The latter replied: "I guess 'twas because they won the last one."

A Smokeless "Smoke House"

EDWIN F. SWEET, acting secretary of commerce, tells the following story on Sir Arthur Shirley Benn, head of the British mission, now on tour of the industrial centers of the United States, under auspices of the national chamber of commerce.

Mr. Sweet was host to the four foreign missions on a visit to Mount Vernon. After visiting the tomb of Washington and going through the historic mansion, Mr. Sweet and Sir Benn strolled over the grounds. As they approached some of the outbuildings, Mr. Sweet asked Sir Benn if he wanted to smoke, offering him a cigar. Sir Benn said yes and Mr. Sweet pointed out the smoke house of the old estate on which the words "smoke house" appeared as a guide to visitors. Sir Benn, who had spent much time in America and who Acting Secretary Sweet thought was familiar with American institutions like smoke houses, immediately started for the building, apparently intending to go inside and "light up."

It was not until Mr. Sweet explained that Sir Benn smilingly admitted it was "one on him."

Holds Unusual Meeting

An unusual meeting of the Newark Foundrymen's association, Newark, N. J., was held Dec. 3. It was participated in by the membership of the Gray Iron club and the Metropolitan Brass association of New York, and was called to bring the foundrymen of the Newark and New York districts closer together. The meeting was addressed by A. O. Backert, editor of *The Foundry*, whose subject was "Some Recent Experiences in England and France," particularly relating to the iron, steel and foundry industries in those countries. The meeting was held at the Downtown club, Kinney building, Broad and Market streets, Newark, and was preceded by a dinner.

The Russell Motor Car Co., Toronto, Can., reports a net profit for the year ended July 31 of $457,878 compared with $628,581 for the previous year. Cash on hand dropped to $183 from the $175,461 of the previous year, but investments in war loans were increased from $321,947 to $556,079.

Industry Quiet in Northwest

Shipbuilding Active But Expected to Slacken Soon—Expansion in all Lines Contemplated—Labor Unrest is Big Factor Hindering Production But Conditions are Tending to Improve Markets—Iron and Steel Strong

SEATTLE, Nov. 25.—With war work practically completed, industrial conditions in the northwest have materially quieted down. There is some contention that shipbuilding will continue to a considerable degree at the chief ports but the consensus of opinion is that early in 1920 the yards will have finished their contracts and only plants doing repair work will be maintained. An exception however, is the G. M. Standifer Construction Co., of Vancouver, Wash., which recently obtained a contract with the Green Star Steamship Corp. of New York for five 9500-ton steel cargo carriers. At present practically all the jobbing foundries are running five days a week with reduced crews, the reduction in the number of men employed being from 10 to 75 per cent. This situation is expected to change for the better about the first of the year. Assurance of an improvement over prewar times is indicated by the fact that many companies are taking up new lines to utilize the extensive facilities and equipment installations made for war purposes, while others are constructing new plants and additions.

At Everett, Wash., the Sumner Iron Works, which filled extensive war orders, is adding to its lines the manufacture of tractors. It has grown steadily since its plant was erected and recently filed notice of its intention to redeem $100,000 of preferred stock, leaving its capital stock at $200,000.

Expansion is in Progress

The Vulcan Mfg. Co., Seattle, has added to its line steel dump bodies for trucks. To better operate and increase output, the Rex Metal Works, Seattle, has purchased the Mars Smelting Co., which has been engaged in the manufacture of brasses and bronzes while the former has been smelting and refining babbitt, or antifriction metals, solders, type metals and special mixtures. The Western Rolling Mill Corp., recently organized at Seattle, will soon start the erection of a 60 x 700-foot steel plant with three open-hearth furnaces of 50 tons capacity each and two continuous furnaces. Installation of an experimental electric furnace is also a probability. The installations will include nine and 22-inch mills for turning out bars, rounds, flats and small angles.

The Consolidated Mining & Smelting Co. with headquarters at Trail, B. C., is reported considering plans for two concentrating plants, one at Rossland and the other at Kimberley. The Kimberley installation will have a capacity of 10,000 tons of copper ore daily. Plans for the Rossland installation have been under consideration for several months. The capacity considered at the outset was 1500 tons, but the quantity of low grade ore to be dressed is said to warrant the use of a 5000-ton plant. The cost of a 1500-ton plant is estimated at $500,000.

The largest magnesite mill in the United States is in operation at Chewelah, Wash., where American engineers discovered one of the largest known magnesite deposits in the country, lying in a belt 18 miles long and a quarter of a mile wide. More than $3,000,000 are now invested there and large quantities of the mineral are being shipped. While the demand for domestic manganese ore has slackened, Montana contributed more than 1/3 of the high grade ore shipped during the first six months of 1919, or 16,026 tons.

Lumber Industry Most Active

Lumbering is the greatest industry of the Northwest. The demand for lumber, especially for rail shipment, now is well under way among the mills of western Oregon and western Washington and gives every prospect of continuing with increased proportion. This is the one exception to the quiet prevailing. The 125 mills contributing to the report of the West Coast Lumbermen's association accepted orders during a recent week for 6,447,843 feet more than actually cut. Inquiries are brisk and the sales movement which usually sets in about the first of the year is making good progress. The prevailing car shortage is preventing the mills from keeping shipments on a level with new business. The rail movement for one week of November was 1495 cars—1111 cars less than the rail orders. The mills now have an aggregate of 8723 cars of unfilled rail orders on their books and no immediate relief from this shortage is in prospect, although more cars will probably be available toward the first of the year. The industry is running almost at capacity.

Congress has agreed upon $6,000,000 for construction work on the Alaska railroad during the coming year. This is of interest to the Northwest as the ports of the section handle all shipments to and from that territory. It is anticipated that opening of the coal, timber, mineral, oil and agricultural sections is not far distant. This means industrial prosperity not only for Alaska but for the Northwest as it assures an unlimited supply of raw materials.

Northwest centers are looking well to the supply of power necessary to operate industries. At the present time Seattle is constructing a 35,000-kilowatt unit of the Skagit river project. This is a small fraction of the horsepower available from this source and development will be continued as the power is needed. At the same time the city is adding largely to its existing plants and private concerns have well developed properties. Tacoma recently voted to acquire the Lake Cushman power site with an ultimate capacity of 75,000 horsepower. At Spokane and Portland private enterprise has developed large units with large reserves of power possibilities to draw from. The Pacific Power & Light Co. is spending $750,000 at Astoria, Oreg., in the construction of a power, light and gas plant. The Sherman County Light & Power Co. is installing a $150,000 steam plant at Centralia, Wash. The Idaho Power Co. has placed orders for machinery necessary for the installation of an 8000 horsepower addition to its power plant at the Thousand Springs on the Snake river. The potential water power of the Northwest is practically without limit and the industrial future of the section in this respect is secure. It has been found necessary however to speed up development in some centers as the demand already exceeds present facilities.

Strikes Hinder Production

One of the chief reasons for the failure of the Northwest to get more fully under way during the past year with a program of reconstruction has been the numerous strikes that have followed in rapid succession. The radical elements have been directing labor union movements for some time, and through their activities contracts have been broken and demands made that are impossible for employers to meet. These leaders and their organs openly announce that it is not a question of better wages and better working conditions, but that they are not so concerned in winning strikes as they are to bring about intolerable conditions in

the hope that eventually the industries will be turned over to the workers for operation. The strike which started labor on this rampage was that which began in the shipyards at Seattle and out of which grew an attempt to carry through a general strike last February. The latest strike involving between 4000 and 5000 men, was that of the building trades in Seattle, which was recently called off by the complete surrender of the union and the return of the men to work under the old scale, and by an open shop policy going in effect.

By reason of the difficulties being experienced by employers throughout the district in getting business under way where union labor is concerned, the open shop is becoming a very attractive proposition to these foremen and this is why the outlook for a better condition in the district is becoming more satisfactory. The United Metal Trades association, employing in normal times more than 7000 men in Oregon and Washington since it was organized, 18 years ago, has stood for and maintained the open shop policy. Numerous attempts have been made to unionize its shops but all have failed. The going wage with additional compensation for efficiency is the rule. The result is industrial peace with satisfactory output.

The iron and steel market is not very active. One dealer reports No. 1 foundry pig iron at $49.20 to $50 a ton Seattle. Another reports the market strong and rising, giving a price of $51 for No. 1 foundry, Seattle. The demand for iron on the coast is not as great as it should be. Business is being done on a strong competitive basis. Uncertainty in shipbuilding and the fact that the usual normal channels are not functioning to full capacity are causes for the dull period.

Prices Tending Upward

Coke is hard to get because of the inability to procure rolling stock. The government will not allow shipments west of the Mississippi river in open top cars and others are scarce. The coke market is firm and prices are going up. The proportion of eastern coke used varies but little from other times and it is holding its own with local coke.

A limited amount of steel bars is moving at 3.60c Seattle for domestic use and at 2.95c Seattle for export. There has been little movement of recent date in cast iron pipe but there are some indications of a revival in the demand. Seattle is to substitute iron mains for wood in a considerable section of the city at a cost of approximately $460,000 and Bellingham, Wash., is asking bids for 81 tons of 8-inch and 55 tons of 12-inch cast iron pipe for watermains. Foundry iron scrap, broken to 150 pounds and less, is being quoted at $35 a ton with the tendency upward. There is considerable moving. The market in steel scrap is upset but some was sold recently for export at $24.

The Seattle representative of the Kawasaki Dockyard Co., Kobe, reports that 30,000 tons of steel material representing an expenditure of $2,700,000 and ordered from the United States Steel Corp. is to be handled through the port of Seattle.

Approximately 1500 tons of steel produced at the Seattle plant of the Pacific Coast Steel Co. was recently booked for shipment to the Orient. Other shipments have been made and more are contemplated.

Tin Plate Mill

Being Built in Canada Making Progress—Want Tariff Body

Toronto, Dec. 2.—Good progress is being made in the construction of the tin plate plant of Baldwins, Ltd., on the site formerly occupied for the manufacture of munitions by the British Forgings, Ltd., under the supervision of J. C. Davies, managing director. The work will cost approximately $1,250,000 and the first unit to be installed provides for eight mills. This will be doubled at a later date and the company intends ultimately to have 42 mills in operation with a view to an annual output of 200,000 tons of tin plate, sufficient to provide for all Canadian requirements. It is hoped to commence actual production by next summer with a working force of about 1800 men. It will be necessary to bring from England a number of skilled workmen as a nucleus of the force. A power wheel of 125 tons is being installed and the company will be a large user of electricity, although it is uncertain whether it can be secured at a sufficiently low cost to render it economical for steel manufacture. The Canadian branch of Baldwins, Ltd., will be known as the Baldwins Canadian Steel Co.

On Nov. 25 deputation from the executive of the Canadian Manufacturers' association had an interview at Ottawa with Sir George Foster, Canadian minister of trade and commerce, and other members of the government. They strongly urged the creation of a permanent tariff commission of experts to act in an advisory capacity in connection with tariff revision. Last session Sir Thomas White, then finance minister, proposed an inquiry into the workings of the tariff by the cabinet to which the government has apparently committed itself. The manufacturers strongly opposed this proposition urging that were the government itself to undertake the investigation it would have the effect of stirring up political agitation and accomplish no beneficial results. It is understood that the government adheres to its plan for a cabinet inquiry, but may eventually appoint a permanent tariff commission.

The Canadian board of commerce has rendered a decision in the case of the Laco-Phillips Co. which charged the Canadian General Electric Co. of Toronto with making use of its patent rights for the manufacture of tungsten wire filaments to restrain trade and commerce in relation to the manufacture of incandescent electric lamps. The board finds that the Canadian General Electric Co. has a monopoly by patent of tungsten wire filament, but not of ordinary electric tungsten lamps, that the company has not operated its monopoly fairly, and that the Laco-Phillips Co. is entitled to have the case reported to the minister of justice under the Combine act, which will be done unless the parties can come to an agreement. The law provides that when patents have been used in restraint of trade the minister of justice shall apply to the Exchequer court for a revocation of the patent.

The United States government has been settling with Canadian companies which had entered into contracts for the manufacture of war material. The process of making adjustments has been rather lengthy in many cases, and there was a good deal of impatience in connection with the delay. The work has been proceeding slowly, however, and several adjustments of importance have been announced. A final settlement was made with the directors of Motor Trucks, Ltd., Brantford, Ont. The plant was erected in the final months of the war, and had barely commenced production when the armistice was signed. Expensive equipment was installed and the plant was regarded as one of the finest of its kind in Ontario. The United States government retains possession of the building and an effort will be made to dispose of it.

The Electric Steel & Forge Co., Cleveland, through A. B. Leach & Co., Inc., is offering $500,000 of 7 per cent preferred stock at 98 accompanied by a bonus of common shares. The proceeds will be used to complete buildings now under construction, the purchase of equipment and to supply additional working capital.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

THE Booth Electric Furnace Co., Monadnock building, Chicago,has opened the following district offices in a number of cities for the sale of electric furnaces for melting steel, iron and nonferrous metals.

For New York and New England, Edward B. Stott & Co., Flatiron building, New York City, with E. F. Tweedy, secretary of the company directly in charge; for eastern Pennsylvania, New Jersey, Maryland, Delaware and southern Atlantic coast states, the Northern Engineering Co., 308 Chestnut street, Philadelphia, with F. W. Doran in charge; for northeastern Ohio, western Pennsylvania and western New York, Charles L. Foster, formerly sales manager of the Electric Furnace Co., Alliance, O., with offices at 879 The Arcade, Cleveland.

* * *

THE Louisiana Steel Co. is to be organized with works in Shreveport, Louisiana, through the Louisiana Finance Co. of the same city, which is to purchase half of the proposed $10,000,000 capital stock. Col. L. P. Featherstone of Beaumont, Tex., and associates in the Texas Steel Co., are the organizers. In connection with the steel plant it is proposed to mine the iron ore in 7000 acres of land purchased in east Texas.

* * *

WHEELOCK LOVEJOY & CO., INC., Cambridge, Mass., announce the opening of two new branch warehouses. One which will be located in Chicago will open Jan. 1, and will be in charge of E. P. Gaffney. The other, located in New York, will open Dec. 15 and will be in charge of W. H. Wallington. The company deals in tool steel, and other high-grade alloy steels.

* * *

THE Pittsburgh Knife & Forge Co., Pittsburgh, recently purchased 16 acres at Coraopolis, Pa., on which it will erect two steel frame buildings, 100 x 700 feet each. The company plans the expenditure of $500,000 on the construction and equipment of these buildings, and is in the market for a crane, seven steam drop hammers, as well as a complete line of forging machinery. When completed this plant will be used in the production of large forgings and the present plant of the company in Pittsburgh, North Side, will be devoted exclusively to the making of the lighter forgings.

* * *

THE Fort Worth Drilling Tool Co., Forth Worth, Tex., is planning to invest several hundred thousand dollars for building and equipping a tool works in that city. The organization is new and was formed with $400,000 capital, of which $350,000 is estimated as the cost of the buildings, machinery and site. Numerous contracts are reported already signed with companies operating in the Texas oil fields.

* * *

SINCE Dec. 1, the American Iron Products Co., Inc., 107 Liberty street, New York, has been operating its nonferrous department. It is in charge of a trained brass and copper man. The purpose of the department is to take over and handle direct, the brass and copper business, heretofore originating through the company's branch offices in foreign countries, which has been diverted through another company, specializing in nonferrous metals.

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THE Rolls-Royce of America, Inc., which has decided to locate in Springfield, Mass., has announced plans for its first plant and engineers are now at work on the details. Five buildings will constitute a group, the first unit occupying 74,000 square feet. They will be of sawtooth type of construction, one story high each. The machine shop will have 32,000 square feet, assembly shop 20,000, test shop 11,000, hardening shop 5000, and office building 6000. The latter will be of steel, wood and brick construction.

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ORIGINALLY formed in 1917 for the purpose of specializing in the manufacture of high speed steel, the Syracuse Alloy Steel Co. has found it necessary to reincorporate. The name of the new company is the Syracuse Alloy Steel Co., Inc., and property has been purchased in the eastern part of Syracuse on which a plant now is being built which will permit of bringing production more in keeping with demand for its output. The plant will be equipped with a sufficient number of additional hammers and rolls. In addition to manufacturing the high speed steel itself, the company manufactures forged side and end milling cutter blanks, etc., as well as forged cutter blanks for special shapes of cutters as required by individual customers. The new plant will allow the company to enter further into the production of intricate forgings, to which it is giving considerable attention. The plant will be ready early in 1920.

* * *

SALES representatives of the Independent Pneumatic Tool Co., Chicago, from all over this country and Canada, met in convention recently at the company's general office, 600 West Jackson boulevard. The meeting was in charge of R. S. Cooper, vice president and general sales manager, other officials assisting being: John D. Hurley, president; F. W. Buchanan, secretary; Adolph Anderson, assistant to president; F. B. Hammerly, works manager; Axel Levedahl, consulting engineer, and R. A. Norling, C. D. An entire day was spent at the company's plant, visiting the different mechanical departments. Ways and means for improving the output as well as service to customers were discussed.

* * *

PLANS have been completed for erection of a plant for the Bridge & Beach Mfg. Co., St. Louis, stove manufacturer, which will embrace all modern improvements in the line of industrial construction. The plant will be comprised of a molding shop, 150 x 322 feet, a cleaning and grinding building, polishing and nickeling building, japanning room, a 3-story mounting building, 54 x 318 feet and a 3-story warehouse, 120 x 255 feet. A center group of buildings will comprise the boiler house, engine house, enameling building, pattern storage building and pattern shop. A storage yard for pig iron, coke, sand, etc., will be provided. The entire plant will be electrically operated from power generated at the plant. The total floor area of the buildings will be 240,000 square feet. The company will employ 700 men and expects to manufacture approximately 100,000 stoves a year, including furnaces.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

OCCUPYING the entire top floor of the Telford building, Waterbury, Conn., the Holaday-Telford Co., Inc., designer and manufacturer of metal patterns, core boxes, pattern plates, tools, jigs, etc., will erect its own plant early in 1920. Incorporated at $10,000, the company announces it will increase the capitalization at an early date to permit of expansion and additions to equipment. A. E. Holaday is president and manager; Joseph Telford is treasurer and W. S. Brakenridge is secretary. For about 12 years prior to Oct. 1, 1919, Mr. Holaday had charge of the pattern department of the Eastern Malleable Iron Co., which operates plants at Bridgeport, New Britain and Naugatuck, Conn. The Holaday-Telford company's shop superintendent formerly was with the Singer Mfg. Co., in charge of the pattern, tool and jig departments. V. J. Richardson, who has been with the Sargent Co., New Haven, Conn., in the experimental department, is an expert on builders' hardware, locks and keys.

* * *

WORK recently was started on the construction of a new machine shop for the Whitmore Machinery & Foundry Co., Menasha, Wis. It is to be a modern building 60 x 116 feet and will be located west of the company's new foundry. Outer walls will be of brick to a height of five feet, from which point construction will be of steel frame and glass. The contract for the work was awarded to the C. R. Meyer & Sons Co., Oshkosh, Wis. A traveling crane will be installed, which will operate the full length of the shop.

* * *

THE Gerstner Boiler Works, Pittsburgh, has doubled its capital to $200,000, to take care of increasing business. Additional steel buildings, 100 x 220 feet, are being erected. The company is working on an order of 152 portable boilers for the western oil trade, for immediate delivery. It also is building 30 steel locomotive tender tanks for export and has booked a large order for steel ship masts for 16 vessels now under construction, as well as a number of smaller orders. Its McDonald plant, which is equipped for the re-ending of boiler tubes exclusively, by a patent process controlled by the Gerstner company, is running 100 per cent.

* * *

FOR the present, the Danielson Tool Co., Wausau, Wis., will devote its attention to the manufacture of a line of 200 different tools and devices for special purposes designed for Ford garages and repair shops. The concern is incorporated in Wisconsin with a capital stock of $100,000 and is a reorganization of the Danielson Engine Works of Chicago, founded in 1915 by Frank Danielson, who becomes vice president of the new company. T. H. Jacob, of Wausau, is president; John M. Lull, secretary, and George Stolze, treasurer. A one-story, fireproof shop, 70 x 200 feet, has been acquired. Castings are being purchased from Wausau foundries, but later the Danielson company intends to install its own casting facilities.

* * *

WITH the Vulcan Plow Co., as its parent company, the Vulcan Implement Factories, Inc., Evansville, Ind., recently was organized to manufacture and sell a complete line of tractor-drawn tillage tools for all makes of tractors. A 4-story plant is being erected for the new enterprise, adjacent to the Vulcan Plow factory, as well as a 1-story forge shop, etc. The Vulcan Plow Co. will continue to manufacture horse-drawn tillage tools, turning over to the new company the line of tractor plows it has been manufacturing for some time. This new plant will probably be in operation by Jan. 1, 1920. Richard Rosencranz is president of the new company; J. H. Berryhill, secretary, and G. A. Trimble treasurer. It is capitalized at $300,000.

* * *

AMONG recent incorporations noted is that of the Kuniholm Mfg. Co., Riverside street, Gardner, Mass. This company, capitalized at $50,000, will manufacture children's vehicles, specializing in hardware, wheels, gears, etc. A plant now is being erected and is expected to be ready for installation of machinery about Nov. 1. This machinery and equipment will include a forge furnace, 13-inch lathe, 16-inch shaper or crank planer, three or four different sized presses, automatic wire cutting and straightening machines, welding machines, bench drills, motors, etc. Officers are: President, Hugo M. H. Kuniholm; secretary and treasurer, C. Harry Kuniholm. In addition to these, Martin Kuniholm and W. Gardner Kuniholm form the board of directors.

* * *

STARTING with sizes from 1 to 7½ horsepower, the Zobell Electric Motor Corp., Garwood, N. J., will manufacture both alternating and direct current motors. Although incorporated last April with a capital of $250,000, the company only recently completed its designs and now announces its intention to incorporate in small motors, many of the refinements found in the larger sizes. Shafts will be removable without disturbing either the core or commutator. If necessary the commutator may be removed without disturbing the shaft or core. The company intends to specialize on special purpose motors, designed for the machine on which they are to be used and present equipment permits an output of from 200 to 300 motors monthly. Fred G. Bell is president; A. T. Zoebisch is treasurer and F. E. Bucker, secretary and superintendent.

* * *

AS PARTNERS, consulting engineers Robert D. McCarter and William L. Cooper, will operate at 165 Broadway, New York City, under the name of McCarter & Cooper. Purchasing for clients will be conducted from 50 Church street, New York City. Mr. McCarter was chief engineer for the General Electric Co., in London, England, prior to 1902. From that time until 1914, he maintained a consulting engineer's office in London, serving the European Westinghouse companies. He also was president and managing director of the Russian Westinghouse Co. He opened an office in New York in 1914. Mr. Cooper who established an office in New York in 1917, was European manager and chief engineer for Robert W. Hunt & Co., for the 15 years preceding that time.

Market Tightens

In Coal-Tar Products Because of Strike—Sulphate Advanced

New York, Dec. 2.—Strength in the coal tar products market is being further accentuated by developments in the coal situation. The refusal of the miners to accept the wage increase proposed by fuel administrator has discouraged the hope that a normal output at the mines will materialize soon. As a result the ovens are dipping into their coal stocks more sparingly, thus influencing production.

Prices generally are tending upward, and in sulphate of ammonia quotations have advanced. The little spot material available is quoted at $3.85 to $4, f.o.b. producers' plants,

Coke Oven By-Products

Spot

Per Gallon at Producers' Plants

Pure benzol	$0.25 to .29
Toluol	.26 to .30
Solvent naphtha	.22 to .27

Per Pound at Producers' Plants

Phenol	nominal
Naphthalin, flake	0.06½ to .07½
Naphthalin, balls	0.08½ to .09½

Per 100 Pounds at Producers' Plants

Sulphate of ammonia	$3.85 to 4.00

Contract

Pure benzol	$0.25 to .29
Toluol	.26 to .30
Solvent naphtha	.22 to .27

Per Pound at Producers' Plants

Phenol	nominal
Naphthalin, flake	0.06½ to .07½
Naphthalin, balls	0.08½ to .09½

Per 100 Pounds at Producers' Plants

Sulphate of ammonia	nominal

for domestic consumption, a rise of about 20 cents, and $4.75 to $5 in double bags at the eastern seaboard, for shipment abroad. Owing to the extent producers are booked up, little contract business is being offered, and future prices are more or less nominal.

There has been no change in offerings and of benzol an advance is regarded likely in the near future. Pure benzol is quoted at 25 to 29 cents, and 90 per cent at 22 to 24 cents. These prices apply to both spot and future material.

Dye interests are coming forward as the largest buyers of naphthalin. The drug trade has now practically brought its buying season to a close. Naphthalin is scarce, at 6½ to 7½ cents in flakes, and 8½ to 9½ cents in balls. Solvent naphtha and toluol are in steady demand. Supplies are fairly plentiful. Solvent naphtha is holding at 22 to 27 cents, and toluol at 26 to 30 cents.

Southern Plants Active

Birmingham, Ala., Dec. 2.—Steel mills operations in the South are steady and there is a strong demand for the various products. Some export steel is moving, the Gulf States Steel Co. having shipped during the past week 1700 tons of billets from the Gadsden plant, bound for Liverpool, via Pensacola. Statement is made in this section that no effort is being made to get export business, as the active demands of domestic consumers will be supplied first. The fabricating plants of Tennessee Coal, Iron & Railroad Co. and the Birmingham Steel Corp. both are working on shapes for ship construction at Mobile. The latter company is taking on commercial work and the expectations are that tanks for use in the Texas and Oklahoma oil fields will bring some round tonnage to the district in the near future.

Erecting New Foundry

Erection of a new foundry building for Richard Roberts & Son, proprietors of the Delta Foundry & Machine Works, Delta, Pa., is expected to be completed by Dec. 10, and will be put into immediate operation. This building replaces one which was destroyed by fire Nov. 2. Efforts of the firemen prevented the blaze from spreading to other buildings of the plant, which include a machine shop, warehouse and pattern shop. The company manufactures steam and electric hoists and canning machinery, and has been in business for the past 35 years.

Opens District Office

The Hyatt Roller Bearing Co. has opened a district office in Cleveland, located at 309 Marshall building. It will conduct a general application department which will consider roller bearing specifications for everything but automobiles and tractors. C. L. Newby, who has represented the company for the past year in the Cleveland territory, is in charge.

Strikers Vote to Return

Striking employes of the H. W. Johns-Manville Co., Manville, near Somerville, N. J., held a meeting on Nov. 25 and decided to return to work at the same wages and under the same conditions as prevailed before the strike was called. The strike lasted 15 days and kept 1500 workers out of employment. It was characterized by considerable violence and 16 of the strikers are in jail serving terms for offenses committed during the trouble.

Steel Strike Handicaps Canadian Industries

Washington, Dec. 2.—Consumers of American steel products in Canada are pinched by shortage of material more now than at any time during the course of the steel strike in the United States, according to Felix S. S. Johnson, American consul at Kingston, Ont., in a report to the bureau of foreign and domestic commerce under date of Nov. 17. Deliveries have been retarded from the different producing areas of the United States, this being particularly true with regard to bars, sheets and tubes, he reports. All available warehouse stocks have been drawn upon to relieve the situation. He says there appears to be no assurance of an approximate date at which improvement will be made. Shipments continue to go through but in insufficient quantities to meet requirements. Buyers of sheets probably will be unable to obtain any sizable shipments until the second or third month of the next quarter. Some fair sized shipments, known to be on the way to Ontario customers, will ease the situation somewhat and distributors are making efforts to get together all supplies of sheets that are available in order to keep customers supplied. Such stocks are for the most part very meager, Mr. Johnson says.

Plates have been going through occasionally and up to Nov. 17, Ontario shipyards were able to proceed without interruption in the initial stages of the construction of vessels ordered for the Canadian merchant marine.

Expect Award Soon

Washington, Dec. 2.—Decision is expected shortly on the award of contracts for 7440 tons of special treatment steel plates and 3960 tons of nickel steel plates for battleships Nos. 49, 50, 51 and 52. The navy's bureau of supplies and accounts last week opened tenders submitted by the Carnegie Steel Co. and the Carbon Steel Co., the only bidders, whose quotations were, respectively, 11.12c and 8.84c and 11.50c and 9.25c per pound on the two lots.

What Does Share Drop Portend?

Stock Market Slump Was Due to Collapse of Over-Expanded Loan Position and Does Not Forecast Depression of Business is Belief—Wall Street Not Functioning Normally—General Financial News

BY JOHN W. HILL, FINANCIAL EDITOR

DOES the recent stock market crash and the consequent subdued tone of speculative activity forecast within a few months a letdown in commodity prices and industrial prosperity? Or if not, then is the share market to be discredited as a prognosticator of developments in the broader business world? These are questions which have formed themselves in the minds of observers since the November epidemic of liquidation began. In normal times they would be more easy to answer, but the war has left conditions in finance and business uncertain in the extreme.

Those who have equal faith in Wall street's ability to discount the future and in the undimmed prospects for continued industrial activity, assert that the stock market for some time has not been normal—but rather suspended its forecasting functions while surrendering itself completely to an orgy of unreasoning speculation.

With the unhealthy elements "shaken out" and with banking credit under reasonable control, it is asserted that the market may be expected once more to begin to reflect in a normal way the real financial sentiment. Accepting this view, it would be folly to attach undue importance to the recent collapse of share values as a forerunner of what may happen in the business world within the next few months.

Speculative Bubble Pricked

The speculative bubble was pricked by the federal reserve board in causing rediscount rates on war paper collateral to be advanced, which together with the tying up of millions of banking credits in goods held in New York harbor while the strike was on, curtailed available money for stock market purposes. The call loan money rates advanced to as high as 30 per cent and as a consequence the over-extended situation, the speculative position of the market was corrected in large measure.

An interesting feature of the situation is the fact that for weeks the share market seized upon the most disquieting news such as industrial unrest, and possibility of peace treaty rejection, and professed to see in them only sources of cheer. That was while prices were still singing upward. Then when the crash came every wire served to sink Wall street's spirits into deeper gloom.

No Price Drop Seen

For the same thing to happen to industry as has taken place on Wall street would necessitate a drop in prices. A number of the strongest possible reasons militate against such an eventuality within the near future, at any rate. In the first place the world's production is sadly in arrears of demand and consumption; next the tremendous inflation of currency and circulating credits both in this country and in Europe, toward deflation of which no step has been taken, will help keep prices high; and last the influence of taxes upon prices is of great importance. Although the importance of taxes as a factor in prices is becoming more and more to be recognized, the problem of how to reduce them will remain unsolved so long as the government needs are so vast.

Perhaps the two most serious problems facing the country are those of the industrial unrest and of demoralized foreign exchange. Were it possible for the cost of living to be kept where it is for a few months the labor question, with industries going and good wages prevailing, the unrest should subside appreciably during the winter. While wages are an overwhelming factor in the prices of commodities another element which grows out of the shortage of goods and which has been exercising a powerful influence on the cost of living in recent months, is that of speculation. Commodity speculation sending prices out of reason and tying up banking credit is just as harmful as stock market speculation and the federal reserve board is believed to be contemplating means of curtailing credits for this purpose.

The European missions which came to the United States to stimulate interest in the extension of credits abroad have returned home, leaving behind them a newly formed committee of powerful American bankers pledged to do all in their power to help Europe. Although the delay in the peace treaty ratification is discouraging to plans in this direction, it would seem that the main obstacle in the way of successful flotation of foreign securities in this country, lies in the indifference of American investors.

So pronounced is this attitude that many bankers believe that it will be necessary for the government to step in the breach and save Europe with credits and raw materials. The state of the foreign exchange doubtless will increase imports to America and reduce exports, yet the demand for commodities in this country is so great that there is little danger of a damming up of goods and a break in prices. Respecting foods, however, export curtailment may operate to reduce prices, a development which would greatly aid the industrial situation through reducing the cost of living. The head of the hog buying department of Armour's has predicted $12 hogs for the winter months, due to decreased exports.

Confirm Sale of Assets of J. V. Thompson

Sale of the assets of Josiah V. Thompson, Uniontown, Pa., bankrupt, was confirmed provisionally recently by William R. Blair, referee in bankruptcy. In one order the referee authorizes the sale of certain specific properties of J. V. Thompson to William M. Hudson and others. In the second order he authorizes the sale of the remainder of the real and personal property of Mr. Thompson to the Piedmont Coal Co. for $5,000,000. In this sum was included $2,600,000 personal property and $2,000,000 in real estate and coal lands in Pennsylvania and $1,000,000 in real estate and coal lands in West Virginia. Possibility of a hold up of the sales still remains for the orders of the referee and do not finally become effective until next week, time being allowed for filing exceptions in the United States district court of Pittsburgh. Sale of the West Virginia property recently was opposed by Thompson creditors in that state and the possibility of further contest is not yet past.

Savage Arms Net Falls

The Savage Arms Corp., Utica, N. Y., for the three months ended Sept. 30 reports surplus, after charges, federal taxes and preferred dividends of $168,704 as compared with $443,611

earned in the preceding quarter and $249,918 for the corresponding quarter last year. For the nine months ended Sept. 30 the surplus available for common dividends amounted to $1,455,097.

Replogle Steel Elects

New York, Dec. 1.—Officers of the newly organized Replogle Steel Co. have been elected as follows: Chairman, J. Leonard Replogle; president, W. H. Brevoort; vice president, Charles MacNeill, who is president of the Utah Copper Co.; secretary, S. H. Bell; treasurer, L. K. Diffenderfer.

W. S. Pilling, Pilling & Crane, Philadelphia, will be added to the board of directors of the Replogle Steel Co., as well as to the board of the Wharton Steel Co., and the executive committee of the Wharton Steel Co., a subsidiary of the Replogle Steel Co., will be comprised of J. Leonard Replogle, W. H. Brevoort, F. K. Sheesley, and W. S. Pilling.

The present directorate of the Replogle Steel Co. is as follows: J. Leonard Replogle, W. H. Brevoort, Harry Payne Whitney, General T. Coleman du Pont, Charles MacNeill, L. W. Baldwin, president of the Empire Trust Co., H. F. Sinclair, president of the Sinclair Consolidated Oil Co., Mortimer L. Schiff, Kuhn, Loeb & Co., and Carl J. Schmidlapp, vice president Chase National bank.

Stock Is Offered

To complete buildings now under construction, for the purchase of equipment, and to acquire additional working capital the Electric Steel Forge Co., Cleveland, is offering $500,000 of 7 per cent preferred stock accompanied by a bonus of common. Upon completion of contemplated additions the company will have an annual capacity of 14,000 tons of electric steel ingots. Three new heating furnaces are being installed. In 1918 the company purchased the Crucible Steel Forge Co., Cleveland.

Plans New Financing

Directors of the General Motors Corp. have authorized a new issue of 7 per cent debenture stock in exchange for the present 6 per cent debenture stock and an issue of 50,000,000 shares of common stock of no par value, of which 14,800,000 will be issued in exchange for the present shares of $100 par value. The plan is subject to the ratification of the stockholders at a special meeting called for Dec. 20. The holders of the 6 per cent debenture shares now outstanding will be given the privilege of subscribing to the new debenture stock at par on the basis of two new shares for one old share, which will have the effect of doubling the outstanding debenture stock and represents financing of $90,000,000 for the corporation. A statement issued by the company says that a careful forecast of the future "indicates that for the company to continue occupying its leading position in the automobile industry large capital investments will be required. The plan will give the company $85,000,000 in cash, which added to present cash assets will give it a total of $175,000,000, "ample to provide for normal expansion to properly develop recently acquired lines and to maintain cash reserves sufficiently large to care for a gross business for 1920 of $800,000,000.

Canadian Car Will Drop Ship Construction

Shipbuilding will be dropped as one of the activities of the Canadian Car & Foundry Co., Montreal, following discouraging results from the construction of one steamship since the armistice, according to the statement of President W. W. Butler, in the annual report of the company. The report shows that for the year ended Sept. 30 gross sales were $33,000,000 as compared with $45,233,000 in 1918. Earnings last year were $2,993,470 against $4,617,390 for the previous year. The company net working capital was $10,363,976 showing a gain over the $9,028,964 of the year before. Because of the necessity of pursuing a conservative course and the fact that taxes, as yet undetermined, will prove a strain on the company's cash position, directors have decided to make no payment of preferred dividends in arrears at present.

Colorado Fuel Earnings Show Some Slump

Without allowance for depreciation but after interest, sinking fund and tax charges, the Colorado Fuel & Iron Co., Denver, reports a surplus of $544,099 for the quarter ended Sept. 30, compared with $627,154 earned in the preceding three months and $959,404 in the corresponding quarter last year. For the nine months ended Sept. 30 the surplus amounted to $1,572,637.

Increases Capital

For the purpose of developing its business of installing and manufacturing electro plating equipment, the Galvanizing Corp. of America, 244-252 Eagle street, Brooklyn, N. Y., recently increased its capital. The company expects to be in the market shortly for gears, machine tools, electric generators and motors.

To Enlarge Business

In order to care for increased business, the Rotospeed Co., Dayton, O., manufacturer of duplicating machines and supplies, contemplates increasing its capital. J. A. Oswald, president and treasurer of the firm, stated that none of the increase will be used for the erection of plant additions or the purchase of additional machinery and equipment.

Will Make Springs

Capitalized at $10,000, the Union Spring Mfg. Co., 101-105 Bryant street, Malden, Mass., recently was incorporated to manufacture and deal in springs of all kinds. Officers of the company are: President, Abraham Blatt; treasurer, David Yessin, and clerk, Abraham S. Goldman.

Financial Crop Ends

VALENTINE WINTERS, president of the Winters National bank, Dayton, O., has been appointed receiver for the Barney & Smith Car Co., on petition of Ballman & Irvin, Cincinnati. Suspension of the business of building and equipping both freight and passenger cars, the chief activity of the company, has brought about its difficulties.

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Stockholders of the Reading Car Wheel Co., Reading, Pa., re-elected their officers as follows: President, H. H. Huyett; secretary and treasurer, W. C. Mullett; general manager, John W. Bowers; directors, H. H. Huyett, W. C. Mullett and E. J. Coleman, of Buffalo, and J. B. Bowers and L. B. Shofer.

* * *

An offering of $5,000,000 of 7 per cent cumulative preferred stock has been announced by the Timken Detroit Axle Co., the portion not taken by the stockholders to be offered to the public at 100 and accrued dividends. The company's sales are said to have increased from $3,263,518 in 1910 to $34,033,564 in 1918.

* * *

Stockholders of the American Bosch Magneto Co., Springfield, Mass., will be given the right to subscribe to 30,000 shares of new stock at $100, it is announced, as a result of a decision to increase the number of shares from 60,000 to 80,000. The right to subscribe is on the basis of one share of new stock for each three now held. Proceeds will be used to retire $1,500,000 of outstanding notes and to expand the company's capacity.

Greatest Year

In Steel Industry's History Coming, Says President of Interstate

Improvements and extensions by the Interstate Iron & Steel Co., especially at its plant at the Calumet river and 118th street, Chicago, will involve the expenditure of about $2,500,000 during the coming year. The company recently disposed of its rerolling mill at Marion, O., to the Pollak Steel Co and will center its activities in the three plants it operates in Chicago. The proceeds of the sale of this mill will assist in financing the Chicago extension.

This could have been done readily from earnings and surplus resources had it been desired as the company has the proceeds of an issue of preferred stock totaling $1,400,000. The company has treasury certificates, Liberty bonds and other investments to a total of about $1,400,000, this item having been increased about $500,000 during the present year. Its surplus was $1,635,536 at the close of the last fiscal year and it has been increased by $483,769 in the interval since. In additions to a liberal allotment of reserves, substantial increase in plant account and writing off of abnormal war costs in inventories. The company has outstanding $4,000,000 common stock, $2,260,200 of cumulative 7 per cent preferred stock and $2,017,800 of 6 per cent serial bonds.

Silas J. Llewellyn, president of the company, says: "The next year should be the greatest in the steel business that was ever known. The labor situation within the industry is clearing rapidly and the only danger is of a serious coal shortage. In any event the cost of fuel will be high as is everything else. I do not see, however, how we can progress toward a lower level of prices in the face of contrary conditions all over the world. There is an enormous demand for commodities of all kinds and the bidding that results from this pressure to buy makes downward revision almost out of the question. We have passed the stage of regulation and will have to work out of the situation as best we can—principally by means of increased production."

To Operate Furnace

Stanton S. Freeman, receiver for the Seaboard Steel & Manganese Corp., has been authorized by the court to operate one of the blast furnaces of this company at Temple, Pa., in the production of foundry pig iron. The furnace is to go in blast immediately and the output is expected to be 4000 to 5000 tons per month. The iron will be disposed of by the Debevoise-Anderson Co., and by Philip E. Wright.

Strike Called Off

The employes of the Globe Iron Co., Jackson, O., manufacturer of high silicon metal, who have been on a strike since July 7, have returned and the furnace has resumed. None of the demands of the men were granted. They returned under the same conditions and wage scale which prevailed when they went out.

Placing Skip Hoists

The Empire Steel & Iron Co. has placed a contract for the erection of a skip bridge at one of its blast furnaces at Catasauqua, Pa. The Thomas Iron Co. is in the market for a skip bridge to be erected at its blast furnace plant at Hokendauqua, Pa.

New Foundry Equipment Company Formed

The Foundry Equipment Export Corp., New York City, has filed articles of corporation with the federal trade commission with an authorized capitalization of $50,000. The officers follow:

T. S. Hammond, Whiting Foundry Equipment Co., Harvey, Ill., president; L. L. Munn, Arcade Mfg. Co., Freeport, Ill., first vice president; E. J. Woodison Co., Detroit, Mich., second vice president; V. E. Minnich, American Foundry Equipment Co., New York City, treasurer; S. T. Johnson, Obermayer Co., Chicago, secretary. The other directors are W. C. Norcross, American Molding Machine Co., Terre Haute, Ind.; R. S. Buch, Buch Foundry Equipment Co., York, Pa.; George L. Grimes, Grimes Molding Machine Co., Detroit.

Obituaries

JOHN F. BARKER, former president and one of the founders of the Gilbert & Barker Mfg. Co., Springfield, Mass., died at his home in that city of heart failure on Nov. 21. Mr. Barker was born in Newton Upper Falls, Mass., Dec. 16, 1839, and located in Springfield in 1862. He began work at the United States armory there in charge of the pipe department at the water shops, where he remained until the founding of the Gilbert & Barker Mfg. Co., in 1865, which was incorporated in 1870. He was treasurer and manager of the company until 1884, when he was elected president, which position he held until he retired in 1911. He was succeeded by R. H. McNall, the present incumbent. For 46 years, Mr. Barker was the dominating personality in the business of the Gilbert & Barker company. He held the affection and esteem of his associates and employes throughout his period of service.

Peter P. O'Horo, secretary and treasurer of the Excelsior Cycle Co., Michigan City, Ind., died on Nov. 24, at that city.

Frank B. Montgomery, traffic manager for the International Harvester Co., Chicago, died Nov. 24, at his home in that city. He became traffic manager of the McCormick Harvester Machine Co. in 1900, and from the formation of the International Harvester Co., in 1902 until his death he was president and general manager of the corporation's industrial railroads.

Edward E. Dwight, 68, president of the E. A. Kinsey Co. and the Tool Steel Gear & Pinion Co., Cincinnati, died on Nov. 16, at his home in Cincinnati.

John F. Koepke, aged 41, foundry superintendent of the Traylor Engineering & Mfg. Co., Allentown, Pa., died Nov. 8 at the Allentown hospital, from burns received at his work on Oct. 13.

Thomas J. Livezey, aged 38, assistant superintendent of the open hearth department of the Alan Wood Iron & Steel Co., Ivy Rock, Pa., died at the Charity hospital, Norristown, Pa., Nov. 18. He had been connected with the Alan Wood company for the past 13 years.

Meinrad Humeltenberg, superintendent of the Golden State & Miners' Iron Works, San Francisco, died Nov. 12 in a hospital in that city. He had been in the employ of the one company for the past 59 years, gradually rising from a minor position until 10 years ago he was made superintendent. He was 71 years old.

November Tool Inquiry was Keen

Machinery Sellers Chief Difficulty is in Obtaining Satisfactory Deliveries From Manufacturers—General Electric Largest Buyer in East—Truck and Tractor Builders Lead in West—Steel Companies Take Cranes

UNABATED and steady though scattered, the demand for machine tools and metalworking equipment continued throughout the month of November. This was true in Canada as well as the United States. As has been the case for many months past, the automotive and allied industries led in requests for prices and in orders closed, although car builders are fast forging to the front as important factors among prospective tool users. It is true that some contraction in buying was experienced because of steel and coal strikes, but these factors did not hamper inquiries. A slight lull was experienced in the East the first part of the month but later came a period of keen activity. This was not as large as it would have been could satisfactory deliveries have been made. This likewise was true in other districts where sellers' efforts were hampered by the fact that builders' delivery dates are set so far into the future. Manufacturers here and there are postponing their purchases of machine tools, cranes, etc., until after Jan. 1, 1920, but so much equipment is needed quickly, this is the exception rather than the rule. Some price advances were noted and some lines have price tags above wartime levels. Complaint is heard from tool builders about under-production. On the other hand, some shops which reduced their payroll some months ago have not put on any more men. Makers of heavy machinery in the Pittsburgh district complain of a scarcity in cleaning room labor.

Truck Manufacturers Taking Many Tools

TRUCK and tractor business has superseded the passenger car demand for tools in the automotive industry. The H. H. Franklin Co., Syracuse, N. Y., is to produce a 1-ton truck, has purchased some equipment and is understood to be preparing a large list. The Acme Motor Truck Co., Cadillac, Mich., purchased a few tools and the Apex Motor Co., at Ypsilanti, Mich., is in the market for truck plant equipment. Extensive buying was done by Milton A. Holmes for the Transport Truck Co., Mt. Pleasant, Mich., and the Reliance Motor Truck Co., Appleton, Wis., will buy $80,000 worth soon.

Activity among the manufacturers of tractors featured the past month's buying. Perhaps the largest purchaser was the General Motors Corp. for the Samson Tractor Division, Janesville, Wis. One order for gear cutters is said to have a value of $160,000. The Four Drive Tractor Co., Big Rapids, Mich., bought $10,000 worth of equipment; the International Harvester Co., Chicago, among other equipment, purchased four 21-inch turret lathes for its tractor plant; and the Allis-Chalmers Mfg. Co., Milwaukee, issued a list.

Passenger car manufacturers have been well equipped during the past few months but continue to take their quota. The Nash Motors Co., Milwaukee, bought $60,000 worth of tool room equipment and will start soon on purchases of production machinery. Dodge Bros., Detroit, issued a comprehensive list, as did the Chevrolet Motor Car Co., Bay City, Mich., and the Hudson and Essex companies, Detroit.

Miscellaneous Demand Keeps Up at Splendid Rate

WIDESPREAD demands for tank cars is given as one of the reasons for the suddenly increased number of inquiries from carbuilders. These lead the requests from miscellaneous manufacturers. The Haskell & Barker Car Co., Michigan City, Ind., issued a sizable inquiry; the American Car & Foundry Co., bought 10 or 12 fabricating tools; the Atlas Car & Mfg. Co., Cleveland, inquired for some equipment and the Magor Car Corp., Passaic, N. J., issued a sizable list. The Greenville Steel Car Co., Greenville, Pa., is to buy equipment for a machine shop. The largest inquiry, numerically, however, came from the General Electric Co., Schenectady, N. Y. It aggregated about 200 tools, over half of which are said to have been purchased. Other large inquiries for equipment were the Akron, O., tire manufacturers. The Goodyear Tire & Rubber Co. revived its inquiry; the Firestone Tire & Rubber Co., issued a list of 36 machines, bought some equipment and postponed closing on the remainder until after Jan. 1. The B. F. Goodrich Co., also is looking for machinery. The Otis Elevator Co., bought equipment for Quincy, Ill., as did the Standard Oil Co., for Bayway, N. J., and Toledo, O. The Perfection Heater Co., Cleveland, issued a list of about 20 machines and a smaller list came out from the Lewis Steel Products Co., Toledo.

Transportation Companies Are Stirring

SOME stir is noted among the railroads. In some quarters this is not expected to develop much for machine tool sellers, since no real buying is anticipated before the return to private ownership and this now seems to be deferred. The Pennsylvania bought cranes for Crestline, O., and Logansport, Ind. The Chicago, Burlington & Quincy railroad, Chicago, revived its list of 50 tools. The Santa Fe and Rock Island railroads, that city, each made some small purchases. The New York Central issued some tentative inquiries in Cleveland and in the east the Western Maryland railroad entered the market for several machines for a repair shop.

Purchases by shipbuilders are more prospective than actual. The Union Shipbuilding Co., Baltimore, is to spend $4,000,000 on new facilities, and the National Concrete Boat Co., Norfolk, Va., is to build a $500,000 yard. The Submarine Boat Co. will buy extensively if it lands a shipbuilding contract. The Robert Dollar Steamship Co., New York, purchased 700 feet frontage on Long Island, N. Y., for a pier.

With Few Exceptions Crane Sales Are One Each

DESPITE the fact that the iron and steel industry recently went through the throes of a general strike, most of the crane business of the past month has come from that branch of manufacturing. With the strike practically ended, some sizable awards are expected soon. The Midvale Steel & Ordnance Co., closed on nine cranes for Johnstown, Pa., however, and the Superior Sheet Steel Co., Canton, O., bought five. The Slick-Knox Co., Pittsburgh, asked for three for Wheatland and the Firestone Steel Products Co., Akron, O., revised its recent inquiry to read six overhead and two hand-operated cranes. The largest inquiry current at present is said to be the one from the Bethlehem Steel Co., calling for 11 cranes for Lebanon, Pa. The Follansbee Bros. Co., Pittsburgh, is taking bids on seven cranes for its new plant at Toronto, O., and the National Tube Co., Pittsburgh, is expected to issue a considerable list soon for its new plant at Gary, Ind. In addition to the seven hammers wanted by the Pittsburgh Knife & Forge Co., Coraopolis, Pa., this company wants some crane equipment. The Concrete Steel Co., New York City, the Newton Machine Tool Works, Inc., Philadelphia, and the Aluminum Co. of America, Marysville, Tenn., each bought two cranes and the Blaw-Knox Steel Co., Hoboken, Pa., took three. Several companies bought or inquired for one crane each.

Tool Purchases Held Until 1920

Users Disinclined to Increase Equipment Stocks During Inventory Time—Pennsylvania Buys for Stark, O., Shops—Brown Hoisting Machinery Books Cranes for Chile — Foote-Burt Wants 17 Cranes

DISINCLINATION on the part of users to add to stocks of equipment at inventory time is holding up sales in various districts. While for the most part November was a satisfactory selling month, particularly in Chicago, some Cleveland dealers find their total sales far below October. No improvement is expected before the middle of January.

Buying of machine tools by brass manufacturers is featured in the eastern market report, the American Bronze Co., Philadelphia, and the Oxweld Acetylene Co., Jersey City, N. J., being mentioned among purchasers. The Pennsylvania is the only railroad reported to be buying. Tools for Stark, O., shops went to eastern builders. The Sun Shipbuilding Co., Chester, Pa., closed on about a dozen tools and the Worthington Pump & Machinery Corp., New York, issued a sizable list, to apply on its 1920 budget.

While there is a lull in buying in Chicago, this is not a slump, since there is an active demand for machinery. Forge shop equipment is being purchased for the tractor plant of the Allis-Chalmers Mfg. Co., Milwaukee. Because of coal strike, some users in the Chicago district are installing oil-burning equipment.

Issuance of a list of 17 cranes by the Foote-Burt Machine Co., Cleveland, is thought to be the forerunner of its machine tool list for its new plant. Machine tool activity is at a low ebb in the Cleveland territory because so many users are holding back orders until after the new year. Inquiries are fairly frequent and presage much business for January. Keen interest is manifest in the latest list issued by the government, comprising 2500 tools, inventoried at $4,000,000. It is claimed that users can buy direct at prices far below prevailing markets. Stocks at the government warehouse of the Symington-Chicago Corp., Chicago, soon will be available for users there. Buying has been slow since prospective purchasers have been held up in favor of Belgium. One list was increased from 84 to 340 tools.

Motor equipment for the Toronto, O., plant of the Follansbee Bros. Co., Pittsburgh, went to the Allis-Chalmers Mfg. Co. and the Westinghouse Electric & Mfg. Co. Cranes have not been awarded as yet. Three hoists were purchased by the Koppel Industrial Car & Equipment Co., Koppel, Pa. The McConway & Torley Co., Pittsburgh, closed on a 7½-ton crane and a crane bridge.

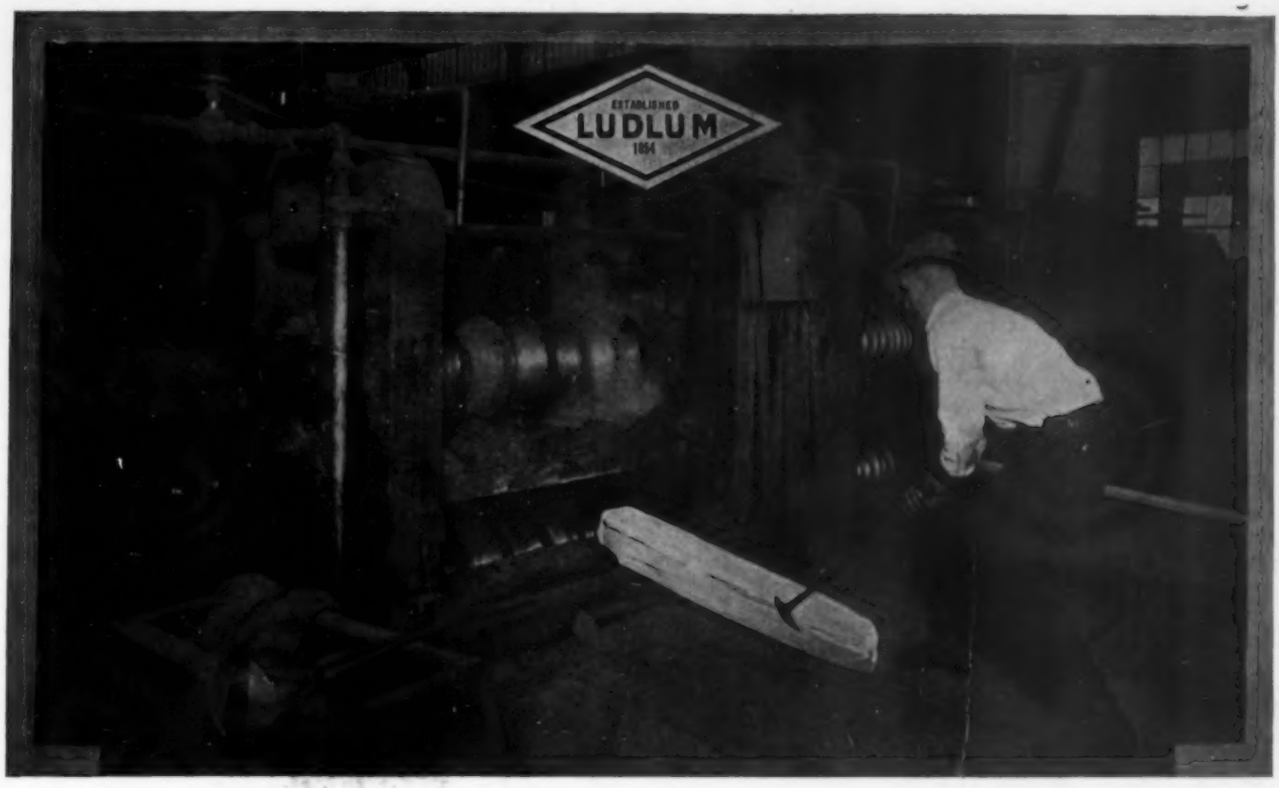
While the lull in overhead cranes continues, some activity is reported in the locomotive crane market. One of the largest export orders placed in recent months went to the Brown Hoisting Machinery Co., Cleveland, for six 15-ton cranes for shipment to Chile. Westinghouse, Church, Kerr & Co., New York, are to close one overhead and a small electric crane for the fertilizer plant of Armour & Co., Chrome, N. J., having already purchased a locomotive crane. These engineers also will buy crane equipment for Armour's fertilizer plant at Baltimore. Prospective crane purchasers include Hudson Iron & Metal Co., Bayonne, N. J.; Stone & Webster, Boston, for Jeannette, Pa.; Bessemer Limestone Co., Bessemer, Pa.; Van Dorn Iron Works and the Superior Foundry, Cleveland; the Du Pont Engineering Co., New York, and the Upson Co., Lockport, N. Y. The Anaconda Copper Co., New York, is to buy a special overhead crane and bids will close Dec. 23 on four special gantry cranes for the New York state barge canal terminals in New York City.

Brass Makers Buy Tools; Chile Awards Cranes

BRASS manufacturers are figuring actively in the eastern machine tool market. The American Bronze Co., Philadelphia, the Oxweld Actylene Co., Jersey City, and a number of other such interests have been recent buyers, closing in the aggregate on a sizable amount of equipment. This activity, however, was featured by no large individual orders, and, in fact, few if any large contracts recently were noted in any quarter. Possibly one exception may be made in the instance of the Pennsylvania lines west, which has bought a number of miscellaneous tools for its shops at Stark, O., a substantial portion of which went to eastern builders. Inquiries for this equipment have been coming out over a number of weeks. The Sun Shipbuilding Co., Chester, Pa., has also been a buyer, closing on a fair list, including a shaper, slotter and a half dozen or so other machines. The Worthington Pump & Machinery Corp., 115 Broadway, New York City, is asking for figures on about $120,000 worth of machine tool equipment for its 1920 budget. The company also is considering one overhead crane in this budget.

Outstanding among developments in the locomotive crane market is the award of six 15-ton cranes to the Brown Hoisting Machinery Co., Cleveland, for shipment to Chile. This is one of the few sizable export orders to be placed this year and therefore is especially notable. That more export business has not developed has been a source of disappointment to locomotive crane builders, for foreign requirements are believed to be heavy, but until there is an improvement in the foreign exchange rate situation no large buying is expected.

Other business in the locomotive crane market includes a 25-ton Ohio crane for the fertilizer plant of Armour & Co.,



High Speed Steel

If you are a manufacturer of high speed steel drills, milling cutters, reamers, etc., you will appreciate the care which is observed in the manufacture of LUDLUM HIGH SPEED STEEL.

Here is shown a close up view of our 18-inch rolling mills. This cogged billet has already been passed thru several times, but it still has to go thru several smaller rolls before it is of the proper dimensions for your particular use. Besides, it will have to be inspected and tested several times, then annealed and inspected again before it is finally shipped to you.

These many operations are what makes Ludlum Steel CONSISTENTLY UNIFORM.

Prompt shipments from warehouse stock at Watervliet, N.Y.; Detroit, Mich.; Chicago, Ill.; or Cambridge, Mass., handled through our Branch Offices.

LUDLUM STEEL
CONSISTENTLY UNIFORM

Mohawk Extra
High Speed Steel

Pompton
Carbon Tool Steel

Seminole
"Foolproof" Chisel Steel

Oneida
Oil Hardening Tool Steel

Yuma
Chrome Magnet Steel

Teton
Ball Bearing Steel

Albany
Alloy Tool Steel

Huron
Alloy Die Steel

LUDLUM STEEL COMPANY

General Offices and Works:
WATERVLIET, N. Y.

Branch Offices:
Chicago Cambridge, Mass. Detroit Buffalo New York City
Cincinnati Cleveland Philadelphia Pittsburgh

at Chrome, N. J. The business was placed through Westinghouse, Church, Kerr & Co., 37 Wall street, New York City. For Armour's Baltimore fertilizer plant, this company wants one each 5 and 10-ton bucket-handling cranes. These interests are also to buy one overhead electric crane, with 100-foot span, to operate a 3-yard clam shell bucket, and a 5-ton electric crane, with 60-foot span, for the Chrome plant. The Hudson Iron & Metal Co., Bayonne, N. J., is inquiring for a used 10-ton locomotive crane. Stone & Webster, Boston, contracting engineers, are in the market for a 20-ton locomotive crane for Jeannette, Pa. Of interest to locomotive crane builders is a large cement plant to be erected near Bessemer, Pa., by the Bessemer Limestone Co. The plant is to have a capacity of 3000 barrls daily. The Atlantic Refining Co., Philadelphia, is inquiring for a 50-ton shear-legged derrick. Revised inquiry from the Sun Shipbuilding Co., Chester, Pa., calls for one 15-ton crane with 76-foot span and two 15 or 20-ton cranes with 112-foot span.

The lull in overhead crane buying continues. The Du Pont Engineering Co. has recently bought a 5-ton overhead crane, and the Upson Co., Lockport, N. Y., has purchased a 3-ton electric crane, with 38-foot span, from the Shepard Electric Crane & Hoist Co., Montour Falls, N. Y. Few other awards have been reported. The Anaconda Copper Co., New York City, is receiving preliminary figures on a special overhead crane, of about 70 tons capacity. There is, however, little likelihood of this business developing in the near future. Bids will be closed Dec. 23 on four special gantry cranes for the New York state barge canal terminals in New York City.

Inventory Time Holds Up Tool Inquiries

SOMETHING of a lull in activity of demand for machine tool equipment is noted by some dealers in the Chicago district, probably due to the approach of inventory time. This does not mean that the market has slumped, but there simply is a little slowing down of active inquiry for the small lots and single tools that have been extremely noticeable for some time.

November promises to be one of the best months of the year in total sales. Many dealers find they have much more equipment on back orders with manufacturers now than at any time recently, deliveries being extended until now comparatively little business can be placed for delivery this side of February and much is even more deferred.

Government selling from the warehouse at the plant of the Symington-Chicago Corp. is slow, at present being held up in favor of shipments to Belgium. A list of 84 was being figured from that collection of tools and this has been increased to 340 by a recent change. Assurances are being given to local dealers that arrangements are being made to move this equipment without red tape and that it will be available for domestic buyers shortly. This will assist greatly in the case of many prospective buyers who cannot obtain their needs from manufacturers without a long wait. The new tractor plant of the Allis-Chalmers Mfg. Co., Milwaukee, is being equipped and is already on a production basis. Some drop forge equipment now is being figured. As a result of the present coal shortage some users are installing oil burning equipment.

Follansbee Cranes Not Yet Awarded

CONTRACTS for the equipment for the new sheet mill at Toronto, O., of the Follansbee Bros. Co., Pittsburgh, steadily are being closed, although it is stated at the company's offices that the cranes for the plant have not as yet been let. Eastern advices had it that the Alliance Machine Co., Alliance, O., had been awarded the heavy duty cranes and that the Pawling & Harnischfeger Co., Milwaukee, was the successful bidder for the lighter cranes. The fact that the present plant of the company is equipped with these makes of cranes no doubt explains the report. The Allis-Chalmers Mfg. Co., West Allis, Wis., has been awarded the sheet mill motors for this plant, which are of liquid control type, while the reversing set has been placed with the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Hubbard & Co. has placed a 10-ton, 46-foot span crane for its new Chicago plant with the Milwaukee Electric Crane Co., Milwaukee, and this company also has been awarded three 4-ton monorail hoists by the Koppel Industrial Car & Equipment Co., Koppel, Pa. The McConway & Torley Co., Pittsburgh, has ordered a 7½-ton Shaw crane through the Pittsburgh office of Manning, Maxwell & Moore, Inc., and has awarded a crane bridge to the Pawling & Harnischfeger Co. Inquiries continue to pour out for cranes and other heavy lines, but for some [illegible], possibly the coal strike, actual orders are few. Not much activity lately has been noted in machine tools.

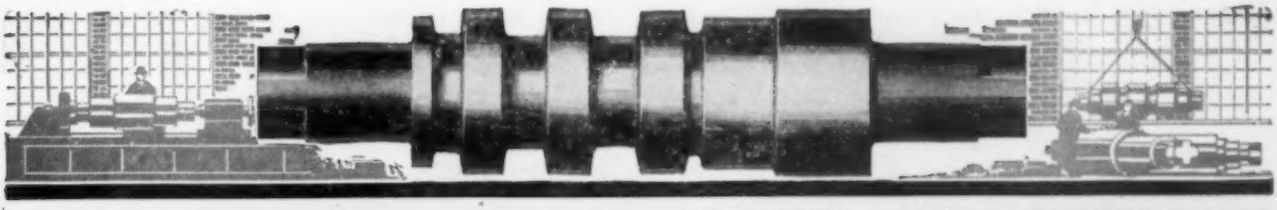
Sales and Inquiries Drop Off in Cleveland

COMPILATION of business transacted during the past month by Cleveland machinery dealers, show considerable of a reduction as compared with October. One dealer states his sales for November were approximately half of what they were the preceding month. In some quarters this was not unexpected, since it is a common thing among users of equipment to postpone purchases at the end of the year. Other users, however, who require equipment quickly, have placed their orders for the best possible delivery which will not be until well along in 1920. Some are postponing awards because they are taking or are about to take inventory but these are not so numerous as formerly because of the increasing practice to maintain perpetual inventories. Both sales and inquiries, however, are at a low ebb.

One of the biggest lists to come out in recent weeks is issued by the Foote-Burt Machine Co., Cleveland, which is erecting a new plant. Negotiations are being conducted for the plant's crane equipment and prices are being asked on 17 electric cranes. These mostly are for small capacities, 1, 2 and 3-ton with two or three 10 ton machines included. No formal list of machine tool equipment has come out, although it is known that the company is lining up its requirements along this line and has made a few decisions. The Superior Foundry Co., Cleveland, still is in the market for a small crane, and the Van Dorn Iron Works, that city, likewise requires crane equipment.

Recent purchasers in the Cleveland market include the Adams Axle Co., Findlay, O., which purchased a centering machine, and the Adams-Bagnall Electric Co., Cleveland. The former company announces its intention to replace with new tools later when better deliveries are possible, the equipment it has purchased since the armistice which does not meet its exact requirements. Another purchaser in Cleveland recently is the Hydraulic Steel Co., that city, which closed on some hammer equipment. It now is taking quotations on 2500 and 3000-pound single frame steam hammers. Hammer equipment likewise is required by the Truscon Steel Co., Youngstown, O., which is taking quotations on No. 4 and No. 5 Nazel power hammers. The Lakeside Forge Co., Erie, Pa., recently closed on 12 hammers for its shop.

Among the smaller inquiries current in Cleveland is one from the Cleveland Metal Products Co., that city,



Say, Fella's—

I find there aint sich a H__ of a difference between men an' metal after all. The less there is in 'em, the more kick an' fuss they kin make, an' the better they are the easier to git along with. Take those HUBBARD ROLLS—good all the way through. Ya never hear a squeak or squawk out of 'em.

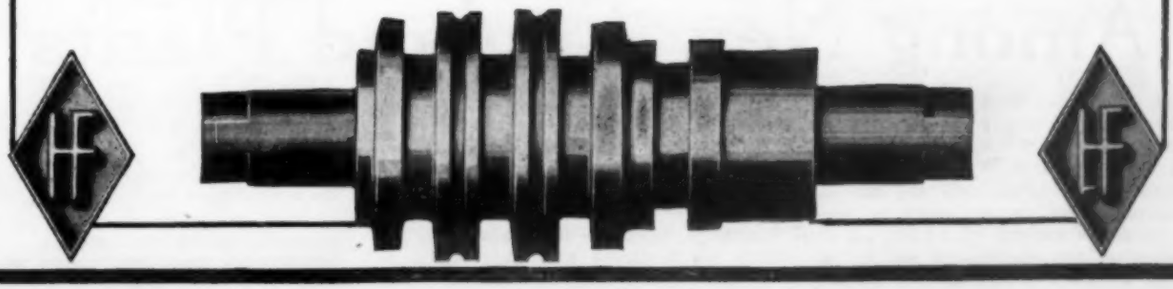
So Long,

Rolling Mill Jim.—

Hubbard Steel Foundry Co.

EAST CHICAGO, IND.

All Kinds of Iron and Steel Rolls and Steel Castings.



and one from the Holt Mfg. Co., Peoria, Ill. The latter calls for one vertical Gould & Eberhardt gear cutter, 36 to 48-inch capacity. A San Francisco dealer, namely the H. F. Lyon Co., is endeavoring to satisfy a customer's requirements in Cleveland. The list calls for one large planer, 48 x 48-inch, one 24-inch shaper, one 24-inch or larger keyseating machine, one 24-inch x 12-foot and one 26-inch x 18-foot lathe. Another California concern soon to be in the market for equipment is the Pacific Iron & Steel Co., Inc., Los Angeles. Its list comprises a large boring mill, several large sized lathes and a few small punches in addition to foundry equipment. This company is to equip a foundry and machine shop as additions to its steel plant.

While the auction sale of approximately 700 government-owned machine tools as well as other equipment at the Eddystone rifle plant, Eddystone, Pa., scheduled for Dec. 4 and 5, arouses but little interest on the part of Cleveland sellers, considerable attention is being paid to the issuance of the latest government-owned equipment list by the war department. As outlined elsewhere in this issue, this list comprises 2500 machine tools with an inventory value of approximately $4,000,000. Interest is manifested in this equipment, mainly for the reason that sales direct to users are militating against the efforts of dealers. Some cases are known where sales at prices far below the market for new tools, have been consummated direct with users, who previously had been endeavoring to supply their wants through dealers. Other prospective purchasers have told the dealers they have an opportunity to buy government-owned equipment but want their quotations, apparently for their comparative value only. Several have said that if unsuccessful in obtaining government-owned machines, they would then be in the market for the equipment in their inquiries.

Contingent upon the successful outcome of some financial arrangements now being planned, some large users are expected to come into the market. The Shelby Tractor & Truck Co., Shelby, O., will buy more equipment, it is understood, when it has sold additional stock. The Timken-Detroit Axle Co., Canton, O., and Detroit, has increased its capital from $4,550,000 to $45,000,000 and some of the proceeds are to be used for additional equipment and buildings, including a machine shop at Canton. If the government purchases the Dayton-Wright airplane plant, at Dayton, O., the General Motors Corp. will take over the McCook field and erect a plant for the manufacture of an air-cooled motor automobile. Two 4-story buildings for the H. C. S. Motor Car Co., Indianapolis, will require considerable equipment. Woodworking machinery probably will be purchased by the Rubay Co., Cleveland, which contemplates a 1-story addition, 100 x 200 feet.

The Union Steam Pump Co., Battle Creek, Mich., is to spend $20,000 on machine shop additions and equipment. The Humphrey Co., Kalamazoo, Mich., will probably make sizable purchases of machinery for a 3-story plant in which it will manufacture water heaters. The Standard Register Co., Dayton, O., will doubtless add to its equipment after its new addition is completed. A machine shop and office building costing $125,000 for the Seibold, Mien Co., Dayton, O., will mean some machinery orders soon. Presses, etc., will be purchased by the Lima Sheet Metal Products Co., Lima, O., early in the spring. Others who are expanding include the Union Motor Co., Bay City, Mich.; the American Gear & Mfg. Co., Jackson, Mich.; The Goodyear Tire & Rubber Co., Akron, O.; the Ames Bonner Co., Toledo, O., and the Franz Foundry & Machine Co., Akron, O.

Canadian Sellers Report Splendid Demand

KEEN demand for machinery and machine tools continues in Canada. The delivery of tools, however, is an adverse factor in trading, and on this account the demand for used and rebuilt equipment is increasing. General machine shop equipment is in demand and the requirements of automobile plants, etc., are almost impossible to fill without considerable delay. Gillies Bros. who are having a sawmill erected at Braeside, Ont., will install electrically-operated machinery and equipment. Soren Bros., Toronto, shortly will be in the market for equipment for a tinware manufacturing plant. Ernst Bros. Co., Mount Forest, Ont., is in the market for one punch and shears, a milling machine and an 8-foot engine lathe. Rahm & Watt, Pelee Island, Ont., are in the market for machinery for mixing cement for the manufacture of cement tile. Appleon & Chipman, engineers, room 11, 68 Wellington street, east, Toronto, are asking for catalogs, prices and information on milling stones, corn-oil machinery, including hydraulic presses, feed dryers, copper converters, vacuum pans, filter presses, attrition mills and spiral conveyors, etc.

Construction and Equipment

Concise and Timely Business Building Opportunities from the Field of Industry

Among New England Plants

AUGUSTA, ME.—The Dirigo Equipment Co. has been incorporated to make window metal weather strips and screens with $10,000 capital, by A. F. Parrott, B. S. Viles and E. M. Thompson.

KENNEBEC, ME.—The Waterville Mfg. Co. has been incorporated with $100,000 capital to manufacture and deal in machinery.

WATERVILLE, ME.—The Waterville Mfg. Co. recently was incorporated to build machinery and make tools and implements with $100,000 capital, by G. W. Wiseman, N. H. Burrows and Carroll N. Perkins.

BOSTON.—The Boston Merchant Marine Sealing Co. has been incorporated to repair vessels, ships and boats, with $25,000 capital, by John J. Collins, Ralph C. Christensen and S. J. Christensen.

BROCKTON, MASS.—The H. F. Crawford Mfg. Co. recently was incorporated with $25,000 capital to manufacture machinery.

CAMBRIDGE, MASS.—The Houde Co. recently was incorporated to make shock absorbers, etc., with $10,000 capital, by James N. Scully, Francis P. Scully and W. J. Goggin.

CAMBRIDGE, MASS.—The Eco Mfg. Co. contemplates a manufacturing building, 50 x 110 feet.

HOLYOKE, MASS.—The Cowan Truck Co. plans a plant addition, 2-stories, 100 x 200 feet.

SPRINGFIELD, MASS.—The Vitrified Wheel Co. contemplates a 2-story, 40 x 80-foot addition.

PAWTUCKET, R. I.—The W. H. Haskell Mfg. Co.,

SIVYER S CASTINGS

Bonnet, of Sivyer Electric Steel, for 50-ton high speed screw-jack made by the Duff Mfg. Co.

The Sivyer Service of providing Electric Steel Castings has for its objects the decrease of machining costs and the increase of wearing-quality and life. Both are attained by methods which result from long experience and begin with the design of the casting itself. When we find that a casting we are asked to furnish is of a design not consistent with good foundry practice, we study its function in the completed unit and offer the necessary suggestions to make it a really practicable casting job without affecting in any way its function and efficiency.

Secondly: Sivyer Service analyzes the functions of the casting and specifies the proper composition steel for the job; long experience with carbon and alloy steels has enabled us to reduce costs and increase quality remarkably for many different industries.

Thirdly: Sivyer Service makes a careful study of the pattern and molding problems involved, for improper gating and insufficient risers are often the greatest wasters of machining labor and metal.

Fourthly: Sivyer Service analyzes carefully the proper annealing methods to be used and controls their proper application through unfailingly efficient equipment and men. In short, the Sivyer Service supervises every step necessary to secure unusually and unfailingly good castings of electric steel. It never relies on one factor alone, relies very little even on the natural freedom of electric steel from occluded gases and on its commonly recognized merit in resisting crystallization. It also depends but little on the inherent scientific accuracy of the electric furnace process. From casting-design to sand-blasting and tumbling, the fundamental superiority of Sivyer Steel is due to its men and metal. Their value is best proved by the fact that, although the production of steel castings is generally looked upon as a local one, the Sivyer market is national.

WHERE the design is such that ordinary castings tend to develop cracks and strains in cooling, the Sivyer method of gating and heading assures castings of unquestioned strength. Lifting-jacks used under heavy railway cars and locomotives must be made of metal known to be dependable, for a failure might mean costly damage, and endanger the lives of the workmen. Also the jacks must be reasonably light to facilitate handling. The toughness of Sivyer Electric Steel, combined with the Sivyer system of gating and heading, produces a light and strong casting that will function unfailingly in the most severe service. The widespread recognition of Sivyer methods and metal has won for Sivyer Castings their national market.

SIVYER STEEL

SIVYER STEEL CASTING COMPANY, MILWAUKEE

24 Commerce street, plans a machine shop addition, 2-stories, 85 x 150 feet, to cost $75,000.

BRIDGEPORT, CONN.—The Bridgeport Worm & Gear Mfg. Co. recently was incorporated with $100,000 capital.

BRIDGEPORT, CONN.—The Bridgeport Hardware Mfg. Co. is expected to start work soon on a plant, 2-stories, 40 x 125 feet, to cost $35,000.

HARTFORD, CONN.—The Royal Typewriter Co. has let a contract for a 5-story, 55 x 308-foot addition.

PROVIDENCE, R. I.—The Master Tool Co. recently was incorporated with $25,000 capital.

SOUTHINGTON, CONN.—The Bristol Brass Co., Bristol, Conn., is reported to be considering property as a site on which to build a plant.

WESTPORT, CONN.—The American Safety Device Co. has been incorporated with $100,000 capital.

North Atlantic States

BROOKLYN, N. Y.—J. G. Kessler & Bros., smelting and refining zinc, has been incorporated with $10,000 capital, by G. J. Goldberg, J. G. and M. Kessler, 649 Manhattan avenue.

BUFFALO.—The Lover Top & Converter Co. is having plans prepared for an addition. Edward Lover is president.

BUFFALO.—Swan & Finch, New York, have bought the property of the Cadillac Refining Co. and will make improvements.

BUFFALO.—The Erie County Traction Corp. has been incorporated with $450,000 capital, by R. B. Austin, E. L. Frost and J. L. Cummings.

BUFFALO.—The Miles Electric Car Lock Corp. recently was incorporated with $500,000 capital, by G. G. Canute, S. Johnston and J. R. Kingsley.

ELMIRA, N. Y.—The Elmira Foundry Co. is reported planning a foundry, 80 x 80 feet, to cost $10,000.

ENDICOTT CITY, N. Y.—The Endicott Johnson Co. contemplates a power house.

JAMESTOWN, N. Y.—The Jamestown Metal Desk Co. has been incorporated with $300,000 capital, by W. R. Reynolds, J. H. Dasher and E. E. Wellman.

LOCKPORT, N. Y.—The Harrison Radiator Corp. let a contract for an addition, 100 x 300 feet.

MIDDLETOWN, N. Y.—The Reinhalter Corp., machine shop, has been incorporated with $50,000 capital, by R. Reinhalter, W. D. Maguire and D. E. Stuart.

NEW YORK.—The Firestone Tire & Rubber Co., according to advices received here, will build a $5,000,000 plant at Hamilton, Canada.

NEW YORK.—The Proctor Automatic Projector Co. has been incorporated with $200,000 capital, by N. Ruttenberg and M. Frank, 165 Broadway.

NEW YORK.—The Economy Hoist & Body Co., Inc., recently was incorporated with $50,000 capital, by L. N. Miller, G. Mayer, 32 Broadway, and others.

NEW YORK.—The Sterling Car Body Corp. recently was incorporated with $50,000 capital, by J. J. Flannery, L. S. Dumensnil and J. J. Meehan, 140 Broadway.

NEW YORK.—The United Metal Spinning Co., 103-105 Mott street, has had plans drawn for a loft building, 5-stories, 50 x 100 feet, to cost $16,000.

NEW YORK.—The Economy Hoist & Body Co. recently was incorporated with $50,000 capital, by L. H. Miller, B. L. Erlman and A. G. Mayer, 32 Broadway.

NEW YORK.—Arthur B. Hennech, Ltd., machines, implements, etc., has been incorporated with $20,000 capital, by A. B. Hennech, I. Neuwirth, 179 Marcey avenue, and others.

NEW YORK.—The Hemco Electric Mfg. Co. recently was incorporated with $100,000 capital, by A. M. Bergenthal, G. Price and W. S. Allen, 53 East Fifty-fifth street.

NEW YORK.—The Empire Tube & Steel Corp. has been incorporated to manufacture cast iron and steel pipe castings, forgings, etc., recently was incorporated with $450,000 capital, by H. V. Craford, G. C. Sprague and A. H. Warren, 120 Broadway.

NEW YORK.—The Rollston Co., auto bodies, has been incorporated with $[illegible], by H. Lonschein, S. Plotkin and B. Davis, 1156 East Twelfth street, Brooklyn, N. Y.

NEW YORK.—The Standard Ship Repair Co. has been incorporated with $50,000 capital, by S. M. Louis, T. M. Constable and F. J. Nolan, 216 President street, Brooklyn, N. Y.

NEW YORK.—The A. P. Miller Supply Co., refrigerating machinery, recently was incorporated with $25,000 capital, by E. R. and G. A. J. Mager and A. P. Miller, 137 East Thirty-fifth street.

NIAGARA FALLS, N. Y.—The Carborundum Co. contemplates an extension.

NYACK, N. Y.—The Ofeldt Gas Fired Boiler Co. recently was incorporated with $100,000 capital, by M. V. Bryant, E. G. and F. A. Ofeldt.

ROCHESTER, N. Y.—Josiah Anstice Co. is having plans drawn for a machine shop, 1-story, 200 x 200 feet, to cost $125,000.

ROCHESTER, N. Y.—The National Fire Escape Corp. has been incorporated with $250,000 capital to manufacture fire escapes, elevators, etc., by W. E. Turner, J. G. Ideman and W. G. Bell.

SCHENECTADY, N. Y.—The General Electric Co. has announced it will double the capacity of its plant at Windsor, Conn., by a building of 40,000 square feet.

SYRACUSE, N. Y.—The Smith Wheel Co., Inc., has had plans drawn for a plant addition, 20 x 92 x 109 feet, to cost $35,000.

SYRACUSE, N. Y.—For the purpose of manufacturing automatic melting machinery, the Nu-Way Milker Co., Inc., has been organized with a capital of $100,000.

TONAWANDA, N. Y.—The King Electric Mfg. Co. recently was incorporated with $25,000 capital, by L. Smith, B. Kibler and V. F. King.

WATERVLIET, N. Y.—The Troy Iron Works contemplates a foundry, 108 x 200 feet, to cost $35,000.

BESSEMER, PA.—A 3000-barrel-a-day cement plant will be erected near here by the Bessemer Limestone Co.

BRIDGEPORT, PA.—The Diamond State Fibre Co. plans a factory and machine shop, 1-story, 60 x 520 feet, at an estimated cost of $75,000.

CONNELLSVILLE, PA.—The Yough Electric Co. is having plans prepared for a plant.

ELLWOOD CITY, PA.—Thomas Dugan, D. E. Frew and Harry E. Fisher have bought a site here on which they plan a manufacturing plant.

ERIE, PA.—The Erie Tool Works has bought the plant of the Brown Folding Machine Co., and will remodel it.

ERIE, PA.—The Erie Motor Truck Mfg. Co., 205 Commerce building, plans a plant, 1-story, 60 x 250 feet, to cost $125,000.

MERCER, PA.—The Reznor Mfg. Co. contemplates an addition to its stove factory.

PHILADELPHIA.—The Perseverance Foundry Co. has let a contract for a foundry.

PHILADELPHIA.—The General Carbonite Co. will build a 2-story factory, 100 x 219 feet.

PHILADELPHIA.—A power house will be built at a cost of $60,000 at the Frankfort arsenal.

PHILADELPHIA.—Contracts have been awarded by M. Boyle for a 1-story machine shop addition, 29 x 30 feet.

PHILADELPHIA.—The Keystone Wagon Works, 1949 West Second street, plans a plant, 3-stories, 75 x 100 feet.

PHILADELPHIA.—Hurley Bros. have the contract to erect a wagon factory building addition, 54 x 61 feet, for Adam Frederick, to cost $10,000.

PHILADELPHIA.—The Philadelphia Textile Machine Co. has awarded the general contract for an addition. The building will be 1-story, 20 x 80 feet.

PHILADELPHIA.—Plans are being prepared for a factory and office building for the Wicaco Screw & Machine Works, to be one and two-stories, 82 x 206 feet.

PHILADELPHIA.—The general contract for a $500,000 warehouse for the Edward G. Budd Mfg. Co. has been awarded. The building will be 4-stories, 100 x 300 feet. In addition, there will be a 1-story steel storage house.

PHILADELPHIA.—Alterations and additions, costing $50,000, will be made at the plant here of the Tabor Mfg. Co., Wissinoming. A 1-story addition will be erected to the office building and a 1-story factory building, 80 x 100 feet, will be constructed.

PITTSBURGH.—The Allegheny Gear Works contemplates a plant addition, 1-story, 80 x 135 feet, to cost $50,000.

READING, PA.—The Gray Iron Foundry Co. will erect an addition, 60 x 92 feet, estimated to cost $22,000.

Central States Activity

BARABOO, WIS.—Moeller Bros. plan a blacksmith and wheelwright shop, 3-stories, 30 x 60 feet, at an estimated cost of $20,000.

BELOIT, WIS.—The Dowd Knife Works, manufacturing cutlery, has awarded contracts for a 1-story shop addition, 60 x 100 feet.

BRUCE, WIS.—A bond issue of $12,000 has been approved for constructing a municipal lighting system.

CAMPBELLSPORT, WIS.—A special election has been called on Dec. 19 to decide the question of issuing $35,000 in bonds for the construction and equipment of a municipal water works and sewerage plant.

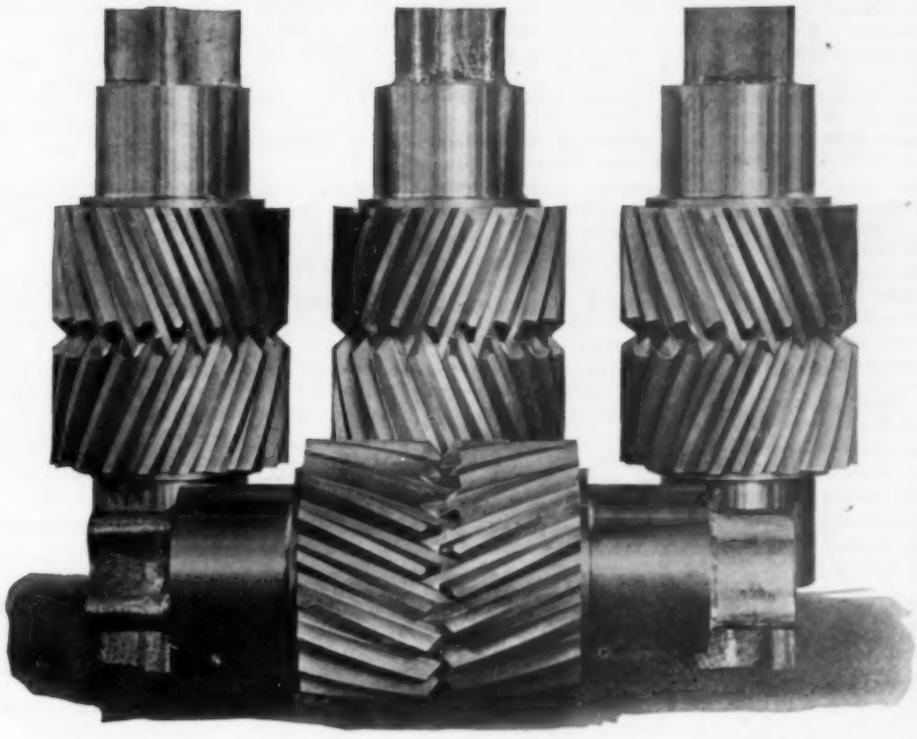
EAU CLAIRE, WIS.—The city will start waterworks improvements shortly and will expend $125,000.

EVANSVILLE, WIS.—Architects Perkins, Fellows & Hamilton, 814 Tower court, Chicago, are preparing plans for a new $150,000 high school, which will include a complete manual training school.

FOND DU LAC, WIS.—Architect J. E. Hennen is preparing plans for a 3-story factory and shop addition, 100 x 100 feet, for the Northern Casket Co., manufacturing wooden and metal caskets. The work will cost about $100,000 including new machinery. William Mauthe is president.

GREEN BAY, WIS.—Plans for a 2-story factory

Gears for All Types of Rolling Mill Service



Open Hearth Steel Castings
FALK HERRINGBONE GEARS

Combine high efficiency, great reliability and long wearing quality with low upkeep.

These advantages, and many others can be derived from an installation of Falk Herringbone Gears.

Steel Castings from 1 to 100,000 lbs.

Write for Particulars

The Falk Company Milwaukee, Wis.

REPRESENTATIVES:

PITTSBURGH, W. O. Beyer, 1007 Park Building
SAN FRANCISCO, F. W. Grimwood, Rialto Bldg.
NEW YORK, M. P. Fillingham, 50 Church Street
DENVER, COLO., Denver Engineering Works
WILKES-BARRE, PENNA., Vulcan Iron Works

addition are being made for the Northern Corrugating Co. The new building will be 100 x 110 feet, and cost about $90,000. H. W. Krueger is president.

HARTFORD, WIS.—The Lohr Auto Co., Ford dealer, will build a 1-story addition, 66 x 100 feet, for machine shop use.

JANESVILLE, WIS.—Articles of incorporation have been filed by the Automotive Machine & Tool Co. to engage in the manufacture of tools, machines, jigs, etc. The organizers are J. R. Culhoun, B. S. Harder and B. W. Fitch.

KENOSHA, WIS.—Louis Schiffman, dealer in scrap metal, junk, etc., has purchased a site for a new scrap handling plant and yard representing an investment of about $35,000.

KEWASKUM, WIS.—The Kewaskum Aluminum Co. has let the general contract for its factory to John L. Stanage Co., 144 Oneida street, Milwaukee. It will be 2-story, 80 x 152 feet. A. L. Rosenheimer is president.

KIEL, WIS.—Stoelting Bros. Co., manufacturer of hardware specialties, has awarded a contract for a plant, 3-stories, 60 x 120 feet, to cost $50,000.

MADISON, WIS.—Contracts have been awarded by the Scanlon-Morris Co., maker of machine shop supplies, for a 2-story addition, 55 x 62 feet.

MADISON, WIS.—Articles of incorporation have been filed by the Johnson Specialty Co., Madison. The capital stock is $10,000 and the objects to manufacture and deal in mechanical appliances. The incorporators are T. C., J. A. and Orvey Johnson.

DETROIT.—The Monarch Foundry Co. will build a foundry, 100 x 200 feet, costing $100,000.

DETROIT.—The National Smelting & Refining Co. plans a foundry, 62 x 106 feet, to cost $30,000.

DETROIT.—The Halley Kerosene Carburetor Co., 145 Willis street, plans a plant addition, 1-story, 60 x 220 feet.

DETROIT.—The General Carbonic Co. will build a 1-story plant 100 x 120 feet, a boiler house 40 x 50 feet, costing $150,000.

DETROIT.—The Mutual Electric & Machine Co., 232 West Fort street, plans a plant addition, 3-stories, to cost $12,000.

CHICAGO.—The Doehler Die & Casting Co., 4129 North Campbell avenue, is building a plant.

CHICAGO.—William Ganschow Co., 1001 West Washington street, will build a 2-story machine shop, 32 x 175 feet.

CHICAGO.—The Ursus Motor Co. is building the first unit of a new plant, 60 x 300 feet, to house an automobile shop, paint shop, engineering and executive offices, and will cost $80,000.

CHICAGO.—The Continental Can Co., 111 West Washington street, has had plans drawn for a plant to cost $200,000.

CHICAGO.—The American Foundry Equipment Co., 110 South Dearborn street, contemplates a machine shop, 1-story, 100 x 200 feet.

CHICAGO.—The Advance Machinery Co., 4645 Ravenswood avenue, contemplates a plant addition, 58 x 100 feet, to cost $10,000.

CHICAGO.—The Jenkins Hydraulic Hoist Co. recently was incorporated with $12,000 capital, by John R. Junkin, Floyd I. Clark and Frank W. Fries.

RANKIN, ILL.—This city plans to start work shortly on a power house, 1-story, 30 x 86 feet.

AKRON, O.—The Goodyear Tire & Rubber Co. is having plans drawn for a machine shop, 5-stories, 160 x 520 feet.

AKRON, O.—The State Foundry Co., 116 Atlas street, is reported contemplating a foundry, 80 x 100 feet, to cost $30,000.

AKRON, O.—The India Machine & Rubber Mold Co. has been incorporated with $100,000 capital, by Walter C. Wenk, Thomas Cline, Jess Letherby, Nat Williams and Russell E. Baer.

CANTON, O.—The Canton Slag Co. recently was incorporated with 50,000 capital, by Richard D. Logan, H. M. Sharp and others.

CINCINNATI.—The Cincinnati Shaper Co. is reported planning an addition, 2-stories, 90 x 240 feet.

CINCINNATI.—The Production Machinery Co. recently was incorporated with $53,750, by E. R. Grossman, Robert Ellison and others.

CLEVELAND.—The Hydraulic Pressed Steel Co., James H. Foster, president, plans to enlarge.

CLEVELAND.—The Rubay Co., 1328 West Seventy-eighth street, is planning an addition, 1-story, 100 x 200 feet.

CLEVELAND.—The Standard Wire & Spring Co., 5915 Bonna avenue, contemplates a building, 90 x 145 feet, 2-stories. The company manufactures coil springs.

CLEVELAND.—The Cleveland Appliance Co. recently was incorporated with $1500 capital, by C. F. Shuler, K. Murman, C. E. Curphen, Thomas P. Schmidt and E. E. Kinnison.

DAYTON, O.—The William Dennick Foundry plans an addition.

DAYTON, O.—The Dayton Castings Co. according to reports contemplates a plant.

DAYTON, O.—Standard Register Co. is erecting an addition affording 8000 square feet of floor space.

DAYTON, O.—The Dayton Metal Bodies Co. plans a plant addition, 1-story, 60 x 100 feet, to cost $35,000.

DAYTON, O.—The Seibold, Mien Co. plans an office building and machine shop, at an estimated cost of $125,000.

DAYTON, O.—Domestic Engineering Co. has purchased the 4-story plant of the Mutual Mfg. Co., Taylor street, and will use it for making farm lighting systems.

DAYTON, O.—Barkalew Metal Products Co., 131 East Second street, has purchased the former car barns of the Green line railroad, Richard street. The company makes automatic screw machine parts.

DAYTON, O.—The Duriron Castings Co., 110 West Bayard street, will take bids soon for an office building, 2-stories, 40 x 97 feet, to cost $25,000.

DAYTON, O.—Assets of the Stone Propeller Co. have been sold to members of the Stinson family, aviators, including Catherine and Marjorie, and James R. Stinson and the family will form a company for the manufactrue of airplanes.

ELYRIA, O.—The City Metal Casting Co. recently was incorporated with $4000 capital, by C. A. Dawson and James Melet.

ELYRIA, O.—The R. & S. Non-Deflecting Valve Co. has been incorporated with $200,000 capital, by Ralph Murbach, Carl Ingwer and others.

FINDLAY, O.—The Findlay Engineering & Mfg. Co. has increased its capital from $25,000 to $60,000.

FINDLAY, O.—The property of the Findlay Iron & Coal Co. has been purchased by the Findlay Engineering & Mfg. Co., and the new owners plan a foundry building.

GREENVILLE, O.—The Daisy Fence & Post Co. recently was incorporated with $100,000 capital, by C. A. Stoltz, G. W. Rhodes, H. P. Stocker and T. M. Stoltz.

MASSILLON, O.—The Peerless Machine & Steel Co. is said to have made arrangements for an addition, 1-story, 109 x 400 feet, to cost $150,000.

PIQUA, O.—The French Oil Mill Machinery Co. is erecting a power house, 1-story, 82 x 84 feet, at an estimated cost of $25,000.

Business in Canada

LES FORGES RAPIDS, QUE.—The Shawinigan Water & Power Co., Shawinigan Falls, Que., plans hydroelectric development here.

MONTREAL, QUE.—Construction has started in connection with an addition to the bolt and nut plant of the Steel Co. of Canada, here.

MONTREAL, QUE.—Moore, Cameron & Hill, Ltd., has been incorporated to manufacture railway, marine and contractors supplies, with $100,000 capital, by A. Wainwright, A. H. Elder, Felix W. Hackett and others.

MONTREAL, QUE.—The Crescent Motors, Ltd., have been incorporated to manufacture motors, engines, automobiles, etc., with $100,000 capital, by Francis G. Bush, Herbert W. Jackson, George R. Drennan and others.

MONTREAL, QUE.—La Compagnie de Glacieres C. P. Fabien, Ltd., has been incorporated to manufacture refrigerators, machinery, cold storage equipment, etc., with $100,000 capital, by Jean M. Fraser, Joseph Lavoie, Joseph N. Chabot and others.

BELLEVILLE, ONT.—The Elliot Machinery Co., Ltd., has been incorporated with a capital of $250,000 to take over the plant and business of the Elliot Woodworker Co., and the plant and property of the Burrell Rock Drill Co., Ltd., Belleville, Ont. The incorporators are Wilson S. Morden, 172 Roxboro street east; Carroll D. Dyke, 768 Shaw street; and others.

BRANTFORD, ONT.—The Brantford Roofing Co., Sydenham street, will build a factory addition to cost $10,000.

BRIDGEBURG, ONT.—The Reliance Mfg. Co., capitalized at $500,000, will establish a plant on Lewis street, for the manufacture of electrical goods.

GALT, ONT.—McCaskey Systems, Ltd., Carlaw avenue, Toronto, Ont., will move its plant to Galt. The company will take over the plant of the Roelofson Machine Tool Co., Beverley street, and will equip it for the manufacture of counter checkbooks, credit registers, and professional systems.

HAMILTON, ONT.—The International Plow Works, Ltd., has awarded the general contract for a plant to cost $200,000.

HAMILTON, ONT.—The Universal Battery Co., Ltd., has been incorporated with $40,000 capital, by William F. Bayliss, Arthur J. Lainchburg, John P. Douglas and others.

MILVERYON, ONT.—The town has employed the E. A. James Co., Excelsior Life building, Toronto, Ont., to prepare plans for waterworks installation.

OTTAWA, ONT.—The Ottawa Car Co., Slater street, has awarded the steel contract to the Dominion Bridge Co., Spark street, in connection with a brass foundry to cost $25,000.

OTTAWA, ONT.—The Celex Mfg. Co., Ltd., has been incorporated with $30,000 capital to manufacture metal and wood specialties, by Frank R. Burgess, Robert H. Pringle and George F. Perley.

STRATFORD, ONT.—The Canadian Phonograph Motors, Ltd., has been incorporated to manufacture motors, etc., with $100,000 capital, by William Preston, David Wright and John R. MacDonald.

TORONTO, ONT.—The Canadian National Carbon Co., 265 Adelaide street west, has a site and will build a plant.

TORONTO, ONT.—The Hopkins Auto Top Renew Co., 200 Gerrard street east, is building a factory addition to cost $10,000.

TORONTO, ONT.—The Canadian General Fire Extinguisher Co., 2440 Dundas street west, will erect a plant to cost $500,000.

TORONTO, ONT.—The Canadian Fairbanks-Morse Co., 1383 Bloor street west, let contracts in connection with a manufacturing building to cost $35,000.

TORONTO, ONT.—The National Steel Car Corp. has been incorporated by James S. Lovell, 25 King street west; George G. Paulin, 76 Grosvenor street;

and others with $500,000 capital. The company will take over the plant of the National Steel Car Co.; and will carry on the manufacture of cars, railroad equipment, machinery, tools, etc.

TORONTO, ONT.—The Baldwin's Canadian Steel Corp., Ltd., has been incorporated by James S. Lowell, 25 King street west; William Bain, Robert Gowans and others with $500,000 capital. The company took over the plant of the British Forgings, Ltd., Ashbridges Bay, Toronto, Ont., and is putting it in order and building an addition for the manufacture of iron, steel, castings, bars, blooms, billets, tin plate, etc.

WALKERVILLE, ONT.—The Hills-Jansen Co., Ltd., has been incorporated with $40,000 capital to manufacture automobile accessories, by C. A. Hills, William B. Jansen and others.

WOODSTOCK, ONT.—The Delong Hook & Eye Co., will establish a plant here for the manufacture of hooks, eyes, safety pins, dome fasteners, and all kinds of steel and wire products.

Business Changes Recently Announced by the Trade

RECENTLY reorganized with J. F. Hines as president, the Madison Pattern & Flask Works, Cleveland, has removed its headquarters to a new plant at 10108 Detroit avenue, that city. Facilities for the production of wood, plaster and metal patterns and for the manufacture of flasks, have been increased by the addition of equipment, etc. A cupola is being installed together with suitable molding and pouring facilities to melt the plant's own nonferrous metals.

* * *

Henry T. Parsons, 309 Hostetter building, Pittsburgh, has changed the name of his general machinery business to Parsons-Moorhead Machinery Co., William L. Moorhead having become affiliated with him.

* * *

The Pacific Coast Steel Co. announces the removal of its Portland, Oreg., office to the Multnomah hotel building. W. J. Maguire is sales agent.

* * *

The Battery Park Trading Co., Inc., has been located at 50 Broad street, New York City, since Nov. 1.

* * *

Following the death of W. P. Sparks, formerly manager of the Indianapolis office of the Cleveland Milling Machine Co., Cleveland, that office has been discontinued. The Indianapolis territory will be covered by D. B. Clark, manager of the company's Chicago office,, 435 Stock Exchange building, Chicago.

* * *

The Federal Bridge & Structural Co., Waukesha, Wis., has reopened its Chicago office, 1228 Peoples Gas building, in charge of M. E. Allen, contracting engineer.

* * *

The Kol-Ben Wire Wheel Co., Detroit, will move to Cadillac, Mich., as soon as a new plant is erected there.

* * *

The Gairing & Needham Tool Co., Detroit, capital $25,000, has changed its name to the Gairing Tool Co.

* * *

The O. S. Bearings Co. has moved into new quarters at 214-18 Artillery avenue, Detroit.

* * *

The Wolf Emery Wheel Co., Meriden, Conn., has recently incorporated under the new name of Wolf New Process Emery Wheel Co., with a capital stock of $500,000. The present plans contemplate expansion of the business to at least three times its past capacity. A new concrete factory will be built to the north of the present factory.

* * *

The name of the Delta Electric Engineering Co., Philadelphia, has been changed to the Delta Equipment Co., 140-142 North Third street, that city.

* * *

The Ohio Blower Co., Cleveland, has changed its name to the Ohio Body & Blower Co.

* * *

The Reading Iron Co., Reading, Pa., has opened new district sales offices in Pittsburgh and Chicago, in charge of F. M. English and R. A. Griffin, respectively.

* * *

The Ingersoll-Rand Co., New York, has opened a branch office in the Sam Houston Life building, Dallas, Tex., to handle the Texas and Oklahoma territory. It is in charge of R. H. Brown, formerly of the St. Louis office.

* * *

The Black & Decker Mfg. Co., Towson Heights, Baltimore, has opened a branch office at 201 Maynard building, Seattle, in charge of A. E. Nordwall.

* * *

The American Chain Co., New York, is opening a branch sales office in Pittsburgh, in charge of W. R. Dawson. It is located in the Bowman building, Third avenue and Ross street, Pittsburgh, and will be ready for business shortly after Dec. 1.

* * *

The Hills, McCanna Co., Chicago, brass and aluminum castings, has acquired a plant at 2025 Elston avenue, Chicago.

* * *

Peter Beck, dealer in railroad and manufacturers' supplies, has moved his offices from 50 Church street to 105 Chambers street, New York City.

* * *

Offices have been opened at 702 First National Bank building, Cincinnati, by Maynard French & Co., who will engage in business as agents for the sale of iron and steel products on a commission basis.

* * *

The Worcester Lathe Co., Worcester, Mass., of which Alonzo W. Whitcomb, formerly president of the Whitcomb-Blaisdell Machine Tool Co., of that city, is the owner, has removed from 68 Prescott street, to the rear of 35 Hermon street, Worcester, its lease of the former premises having expired. It has taken two floors in the A. H. Steele Co. factory, which has moved to its new plant.

* * *

W. M. MacCleary has acquired the entire interest of W. M. MacCleary & Co., 2 Rector street, New York City, and will operate solely under his own name. The company deals in iron and steel products.

* * *

The Interstate Iron & Steel Co., 104 South Michigan avenue, Chicago, has opened an office in the First Wisconsin National Bank building, Milwaukee, in charge of Arthur R. Jones, assisted by Charles Belik, formerly of the head office. The Interstate company has appointed the Certes Supply Co., St. Louis, as its sales representative in that territory.

* * *

The Pittsburgh Screw & Bolt Co. has opened branch offices in New York City, at 50 East Forty-second street, with J. Allen Dillon in charge as manager of sales.

Iron and Steel Prices

Corrected to Tuesday Noon

Iron Ore

Superior Ores, Per Ton, Lower Lake Ports

Old range Bessemer, 55 iron	$6.45
Mesabi Bessemer, 55 iron	6.20
Old range non-Bess., 51½ iron	5.70
Mesabi non-Bes., 51½ iron	5.55

Manganese Ore

Brazilian, 45 to 50 per cent, c.i.f. Atlantic ports, 55c per unit, nominal.

Indian, 45 to 50 per cent, c.i.f. Atlantic ports, 55c per unit, nominal.

Warehouse Prices

Steel bars, Boston	3.40c
Steel bars, Chicago	3.37c
Steel bars, Cleveland	3.27c
Steel bars, Detroit	3.33c
Steel bars, Philadelphia	3.60c
Steel bars, New York	3.52c
Steel bars, St. Louis	3.44c
Steel bars, Cincinnati	3.33c
Steel bars, St. Paul	3.595c
Steel bars, Buffalo	3.365c
Iron bars, Boston	3.55c
Iron bars, Buffalo	3.95c
Iron bars, Chicago	3.37c
Iron bars, Detroit	3.33c
Iron bars, St. Louis	3.44c
Iron bars, Cincinnati	3.33c
Iron bars, Philadelphia	3.60c
Iron bars, New York	3.52c
Shapes, Chicago	3.47c
Shapes, Detroit	3.43c
Shapes, Boston	3.50c
Shapes, St. Louis	3.54c
Shapes, St. Paul	3.695c
Shapes, New York	3.47c
Shapes, Cleveland	3.37c
Shapes, Philadelphia	3.70c
Shapes, Buffalo	3.55c
Shapes, Cincinnati	3.43c
Plates, Buffalo	3.665c
Plates, Chicago	3.67c
Plates, Detroit	3.63c
Plates, Boston	3.95c
Plates, St. Louis	3.74c
Plates, St. Paul	3.895c
Plates, New York	3.67c
Plates, Cleveland	3.57c
Plates, Philadelphia	3.90c
Plates, Cincinnati	3.63c
No. 10 blue anl. sheets, N. Y.	4.82c
No. 10 blue anl. sheets, Phila.	5.00c
No. 10 blue anl. sheets, Chicago	4.57c
No. 10 blue anl. sheets, Cleveland	4.47c
No. 10 blue anl. sheets, Boston	5.15c
No. 10 blue anl. sheets, Buffalo	4.565c
No. 10 blue anl. sheets, St. L.	4.64c
No. 10 blue anl. sheets, Cincinnati	4.53c
No. 10 blue anl. sheets, St. Paul	4.79c
No. 10 blue anl. sheets, Detroit	4.53c
No. 28 black sheets, Chicago	5.62c
No. 28 black sheets, New York	6.00c
No. 28 black sheets, Phila.	6.00c
No. 28 blacfi sheets, Cleveland	5.27c
No. 28 black sheets, Boston	6.65c
No. 28 black sheets, Cincinnati	4.93c
No. 28 black sheets, Detroit	5.58c
No. 28 black sheets, St. Louis	5.69c
No. 28 black sheets, St. Paul	5.845c
No. 28 black sheets, Buffalo	5.865c
No. 28 galv. sheets, Chicago	6.97c
No. 28 galv. sheets, New Yor	7.25c
No. 28 galv. sheets, Phila.	7.50c
No. 28 galv. sheets, Boston	8.09c
No. 28 galv. sheets, Cleveland	6.62c
No. 28 galv. sheets, Cincinnati	6.28c
No. 28 galv. sheets, Detroit	6.93c
No. 28 galv. sheets, Buffalo	7.215c
No. 28 galv. sheets, St. Louis	7.04c
Bands, New York	4.22c
Bands, Boston	4.85c
Bands, Detroit	4.03c
Bands, Buffalo	4.065c
Hoops, Buffalo	4.065c
Hoops, Boston	4.95c
Hoops, New York	4.47c
Hoops, Detroit	4.03c
Cold rolled shafting, Buffalo	4.85c
Cold rolled shafting, New York	5.00c
Cold rolled flats, squares and hexagons, New York	5.50c

Sheet Schedule—(Black)

Differentials for gage, per 100 pounds.

No. 30	+20c
No. 29	+10c
No. 28 (carloads)	Base
No. 27	—05c
Nos. 25-26	—10c
Nos. 22-24	—15c
Nos. 17-21	—20c
Nos. 15-16	—25c
Nos. 13-14	—30c
Nos. 10-12	—35c

Standard Sizes

Gages Nos. 12 to 30 inclusive, 24, 26, 28 and 30 inches wide by 72, 84, 96 and 120 inches long. Gages Nos. 14 to 28 in addition to the foregoing, 36 wide by 96 inches and 120 inches long. Extras for width and length to be added.

Galvanized and Long Terne

Differentials for gage, per 100 pounds.

No. 30	+50c
No. 29	+25c
No. 28 (carloads)	Base
No. 27	—15c
Nos. 25-26	—30c
Nos. 22-24	—45c
Nos. 17-21	—60c
Nos. 15-16	—75c
Nos. 12-14	—90c
Nos. 10-11	—1.00

Standard Sizes

Gages Nos. 12 to 30 inc., 24, 26, 28, 30 and 36 in. wide by 72, 84, 96 and 120 in. long. Extras for width and length to be added.

Freight Rates, Pig Iron

Mahoning and Shenango valleys to:

Cleveland	$1.40
Newark, N. J.	4.80
Boston	5.20
Philadelphia	4.40
Pittsburgh	1.40
St. Louis	4.60
Minneapolis, St. Paul	5.70

Buffalo to:

Albany, N. Y.	$1.80
New England (rail)	3.90
New York and Brooklin (rail)	3.90

Virginia furnaces to:

Philadelphia	$4.10
New England	4.70
Brooklyn, Jersey City, Newark	4.40

Birmingham, Ala., to:

Boston	$8.00
Cincinnati	3.60
Chicago	5.00
Cleveland	5.00
Louisville, Ky.	3.30
Minneapolis, St. Paul	7.30
New York	7.70
Philadelphia	6.50
Pittsburgh	5.70
Savannah, Ga.	3.40

Chicago to:

St. Louis	4.25
Des Moines	$3.50
Minneapolis, St. Paul	2.50
Milwaukee	.60
Moline, Ill.	1.40
Omaha	4.50
St. Louis	1.90

Ironton and Jackson, O., to:

Chicago	$3.80
Cincinnati	1.80
Cleveland	2.40
Dertoit	.60
Indianapolis	2.30
Minneapolis, St. Paul	5.70

Freight Rates, Finished Material

Pittsburgh, carloads, per 100 lbs., to:

New York	27.0 cents
Philadelphia	24.5 cents
Boston	30.0 cents
Buffalo	21.5 cents
Baltimore	23.0 cents
Cleveland	17.0 cents
Cincinnati	23.0 cents
Chicago	27.0 cents
Detroit	23.0 cents
Minneapolis and St. Paul	49.5 cents
Denver	$1.09
St. Louis	33.5 cents
New Orleans	38.5 cents
Birmingham	57.5 cents
Pacific coast (all rail)	1.25
Pacific coats (tin plate)	1.25

Blue Annealed

Differential for gage per 100 pounds

Nos. 8 and heavier	— 5c
Nos. 9 and 10 (carloads)	Base
Nos. 11 and 12	+ 5c
Nos. 13 and 14	+10c
Nos. 15 and 16	+20c

Standard Sizes

Widths—24-26-28-30-36 and 48 inches.
Lengths—72-84-96-120 and 144 inches.
Extras for width and length to be added.

Tubular Goods

Steel Pipe

Pittsburgh basing discounts to jobbers in carloads

STANDARD WEIGHT

Butt Weld

	Black	Galv.
⅛, ¼ and ⅜-inch	50½	24
½-inch	54½	40
¾ to 3-inch	57½	41

Lap Weld

2-inch	50½	38
2½ to 6-inch	53½	41
7 to 12-inch	50½	37
13 to 14-inch	41	..
15-inch	38½	..

PLUGGED AND REAMED

Butt Weld

1 to 3-inch	55½	42
2-inch	48½	36

Lap Weld

2½ to 6-inch	51½	39

EXTRA STRONG PLAIN ENDS

Butt Weld

⅛, ¼ and ⅜-inch	46½	29
½-inch	51½	39
¾ to 1½-inch	55½	43
2 to 3-inch	56½	44

Lap Weld

2-inch	48½	37
2½ to 4-inch	51½	40
4½ to 6-inch	50½	39
7 to 8-inch	46½	33
9 to 12-inch	41½	28

DOUBLE EXTRA STRONG PLAIN

Butt Weld

½-inch	42½	32
¾ to 1½-inch	45½	35
2 to 2½-inch	47½	37

Lap Weld

2-inch	40½	31
2½ to 4-inch	42½	33
4½ to 6-inch	41½	32
7 to 8-inch	36½	23

Wrought Iron Pipe

Pittsburgh basing discounts to jobbers in carloads

THREADS AND COUPLINGS

Butt Weld

	Black	Galv.
⅛-inch	1	+14
¼-inch	24½	+ 2½
⅜-inch	25½	+ 1½
½-inch	29½	11½
¾ to 1½-inch	34½	18½

Lap Weld

2-inch	28½	14½
2½ to 6-inch	30½	17½
7 to 12-inch	27½	14½

PLUGGED AND REAMED

Two points less than above

EXTRA STRONG PLAIN ENDS

Butt Weld

⅛, ¼-inch	+21	+36
⅜-inch	23½	6½
½-inch	28½	15½
¾ to 1½-inch	34½	19½

Lapp Weld

2-inch	29½	16½
2½ to 4-inch	31½	19½
4½ to 6-inch	30½	18½
7 and 8-inch	22½	10½
9 and 12-inch	17½	5½

DOUBLE EXTRA STRONG PLAIN ENDS

Butt Weld

	Balck	Galv.
½-inch	15½	3½
¾ to 1½-inch	20½	8½

Lap Weld

2-inch	16½	4½
2½ to 4-inch	18½	9½

Lapweld Boiler Tubes

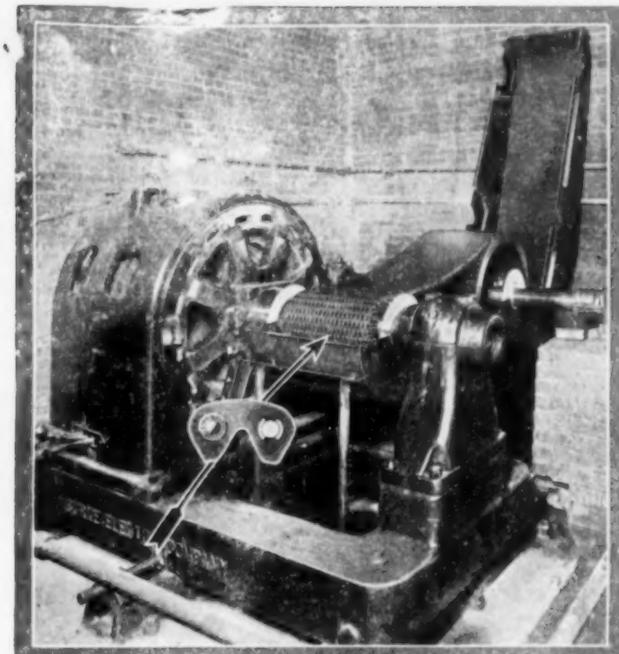
Discounts off manufacturers' standard list, in carloads; less carloads, 4 points less.

Steel

1¾ and 2-inch	19
2¼-inch	24
2½ to 3¼-inch	30½
3½ to 4½-inch	40½

Iron

1¾-inch	+20
2 and 2¼-inch	+10
2½ and 2¾-inch	+ 1
3 and 3¼-inch	— 1½
3½ to 4½-inch	—16



Why Link-Belt Silent Chain is the Correct Drive

COULD any other form of power transmission operate with efficiency on the short centers shown in these illustrations? This drive like hundreds of others, is operating almost continuously—it has never been shut down for repairs. The plant in which it is installed depends upon its constant daily performance.

Note the drive is enclosed in the patented Link-Belt oil-tight, dust-proof casing. Lubrication automatically reaches the chain. Safety to employees is assured. And the drive is, like all Link-Belt Silent Chain Drives, 98.2% efficient.

Let us show you where you can use an efficient Link-Belt Silent Chain Drive in your plant.

LINK-BELT COMPANY

384

PHILADELPHIA		CHICAGO		INDIANAPOLIS	
New York	299 Broadway	Huntington, W. Va.		Robson-Prichard Bldg.	
Boston	49 Federal St.	Cleveland	629 Rockefeller Bldg.		
Pittsburgh	1501 Park Bldg.	Detroit	922 Dime Bank Bldg.		
St. Louis	Cent'l Nat'l Bank Bldg.	Minneapolis	418 S. Third St.		
Buffalo	347 Ellicott Square	Kansas City, Mo.	906 Dilsharst Bldg.		
Wilkes-Barre	26 Nat'l Bank Bldg.	Seattle	570 First Avenue, S.		
		Portland, Ore.	First and Stark Sts.		
		San Francisco	562 Market St.		
		Los Angeles	163 N. Los Angeles St.		
		Toronto, Can.	Canadian Link-Belt Co., Ltd.		
		Denver	Lindrooth, Shubart & Co., Boston Bldg.		
		Louisville, Ky.	Frederick Vehie, Starks Bldg.		
		New Orleans	C. O. Hine, Hibernia Bank Bldg.		
		Birmingham, Ala., S. L. Morrow, 120 Brown-Marx Bldg.			
		Charlotte, N. C.	J. S. Cothran, Com'l Bank Bldg.		

We Also Make

- ☐ Elevators and Conveyors
- ☐ Link-Belt and Sprockets
- ☐ Silent Chain Drives
- ☐ Truck and Tractor Chains
- ☐ Electric Hoists
- ☐ Locomotive Cranes
- ☐ Portable Loaders
- ☐ Coal and Ashes Systems
- ☐ Coal Pockets

Write for Catalogs
Place X in Square

LINK-BELT
SILENT CHAIN DRIVES

Iron and Steel Scrap Prices

Corrected to Tuesday Noon

Steel Works Scrap

Gross Tons Delivered to Consumer

HEAVY MELTING STEEL

Pittsburgh	$24.50 to 25.00
Chicago	21.00 to 21.50
Eastern Pennsylvania	22.50 to 23.00
Cleveland	20.50 to 21.00
St. Louis	21.50 to 22.00
Buffalo	23.00 to 23.50
New York (dealers)	18.00 to 18.50
Cincinnati	18.50 to 19.00
Birmingham	20.00 to 21.00
Valleys	22.75 to 23.00
Boston (dealers)	16.50 to 17.50

BUNDLED SHEETS

Pittsburgh	18.50 to 19.00
Eastern Pennsylvania	18.50 to 19.00
Cleveland	13.50 to 14.00
Buffalo	15.50 to 16.00
Cincinnati	13.50 to 14.00
St. Louis	13.50 to 14.00

STEEL RAILS, SHORT

Chicago	$25.00 to 25.50
Boston (dealers)	15.50 to 16.00
Cleveland	19.00 to 20.00
St. Louis	24.50 to 25.00
Birmingham	22.00 to 23.00
Cincinnati	22.00 to 22.50
Eastern Pennsylvania	22.50 to 23.00

STOVE PLATE

Pittsburgh	$22.00 to 23.00
Chicago	29.25 to 29.75
Eastern Pennsylvania	22.50 to 23.00
Cleveland	22.00 to 23.00
St. Louis	26.00 to 26.50
Buffalo	23.00 to 23.50
New York	19.50 to 20.00
Cincinnati	20.50 to 21.00
Birmingham	23.00 to 24.00
Boston	22.00 to 23.00

LOW PHOSPHORUS

Pittsburgh, billet and bloom crops	$27.00 to 28.00
Chicago, billet and bloom crops	24.00 to 25.00
Eastern Penn. (guaranteed)	26.00 to 27.50
Buffalo	27.00 to 28.00

SHOVELING STEEL

Chicago	$20.50 to 21.00
St. Louis	20.00 to 20.50

KNUCKLES, COUPLERS AND SPRINGS

Pittsburgh	$24.50 to 25.00
Chicago	24.50 to 25.00
St. Louis	23.50 to 24.00

BALED SHEETS

Pittsburgh	22.00 to 22.50
Chicago	15.50 to 16.00

FROGS, SWITCHES, GUARDS

Chicago	21.00 to 21.50
St. Louis	21.00 to 21.50
Eastern Pennsylvania	21.00 to 22.00

BOILER PLATE, CUT

Chicago, No. 1	$19.00 to 19.50
St. Louis	17.00 to 17.50

ANGLE BARS—STEEL

Chicago	$24.50 to 25.00
St. Louis	20.00 to 20.50

Iron Mill Scrap

Gross Tons Delivered to Consumer

RAILROAD WROUGHT

Pittsburgh, No. 1	$25.00 to 26.00
Pittsburgh, No. 2	23.50 to 24.00
Chicago, No. 1	28.00 to 29.00
Chicago, No. 2	23.50 to 24.00
Eastern Pennsylvania, No. 1	29.00 to 30.00
Cleveland, No. 1	24.50 to 25.00
St. Louis, No. 1	23.00 to 23.50
St. Louis, No. 2	22.50 to 23.00
Buffalo	24.00 to 24.50
Cincinnati, No. 1	21.50 to 22.00
Birmingham, No. 1	20.00 to 21.00
New York, No. 1 (dealers)	27.00 to 27.50
Boston (dealers)	24.00 to 28.00

WROUGHT PIPE

Eastern Pennsylvania	$22.00 to 23.00
Eastern Pennsylvania, ungraded	17.00 to 18.00
Buffalo	18.50 to 19.00
New York (dealers)	18.00 to 18.50
Boston (dealers)	14.00 to 15.00

YARD WROUGHT

Eastern Pennsylvania, No. 1	$25.00 to 26.00

CITY WROUGHT

New York, long (dealers)	20.00 to 21.00

BUSHELING

Chicago, No. 1	$22.00 to 22.50
Chicago, No. 2	15.50 to 16.00
Cleveland, No. 1	18.50 to 19.00
Cleveland, No. 2	15.00 to 15.50
St. Louis, No. 1	21.50 to 22.00
Buffalo, No. 1	20.00 to 21.00
Cincinnati, No. 1	16.50 to 17.00
Eastern Pennsylvania, No. 1	19.00 to 20.00

MACHINE SHOP TURNINGS

Pittsburgh	$15.00 to 16.00
Chicago	12.00 to 12.50
Eastern Pennsylvania	18.50 to 19.50
Eastern Pennsylvania (blast furn.)	17.00 to 18.00
Eastern Pennsylvania (chemical)	23.00 to 25.00
Cleveland	12.50 to 13.00
Buffalo	14.50 to 15.00
New York (dealers)	14.00 to 14.50
St. Louis	15.00 to 15.50
Cincinnati	7.50 to 8.00
Birmingham	11.00 to 13.00
Valleys	13.50 to 14.00
Boston (dealers)	12.50 to 13.50
Boston (blast furnace) (dealers)	11.50 to 12.00

CAST IRON BORINGS

Pittsburgh	$18.50 to 19.00
Chicago	13.50 to 14.00
Eastern Pennsylvania	20.00 to 21.00
Eastern Pennsylvania (chemical)	23.00 to 25.00
Cleveland	16.00 to 16.50
St. Louis	13.00 to 13.50
Buffalo	17.50 to 18.00
New York (dealers' price)	17.50 to 18.00
Cincinnati	11.00 to 11.50
Birmingham	11.00 to 13.00
Valleys	17.50 to 17.75
Boston (dealers)	15.00 to 16.00
Boston (blast furnace) (dealers)	11.50 to 12.00

IRON AXLES

Pittsburgh	$44.00 to 45.00
Chicago	39.50 to 40.50
Eastern Pennsylvania	40.00
Cleveland	35.00 to 36.00
St. Louis	36.00 to 36.50
Buffalo	33.00 to 34.00
Cincinnati	23.00 to 23.50
Birmingham	29.00 to 30.00

IRON RAILS

Chicago	28.50 to 29.00
Cleveland	27.00 to 28.00
St. Louis	26.50 to 27.00
Buffalo	25.00 to 26.00
Cincinnati	23.00 to 23.50

PIPES AND FLUES

Chicago	21.00 to 21.50
Cleveland	17.50 to 18.00
St. Louis	20.00 to 20.50
Cincinnati	15.00 to 15.50

GRATE BARS

Chicago	28.50 to 29.00
Cleveland	22.00 to 23.00
Buffalo	21.00 to 21.50
New York	17.50 to 19.00
Eastern Pennsylvania	24.00 to 25.00

FORGE FLASHINGS

Cleveland, large	$16.75 to 17.25
Cleveland, small	18.00 to 18.50
Chicago, small	17.50 to 18.00
Boston (dealers)	13.00 to 13.50

FORGE SCRAP

Chicago	23.50 to 24.00
Eastern Pennsylvania, No. 1	17.50 to 18.50
Boston	14.00 to 14.50

ARCH BARS AND TRANSOMS

Chicago	32.50 to 33.00
St. Louis	29.00 to 30.00

ANGLE BARS—IRON

Chicago	$30.00 to 30.50
St. Louis	26.00 to 26.50

Iron and Steel Works Scrap

Gross Tons Delivered to Consumer

AXLE TURNINGS

Pittsburgh	$18.00 to 19.00
Eastern Pennsylvania	19.00 to 20.00
Boston (dealers)	13.00 to 14.00
St. Louis	15.00 to 16.00
Cleveland	19.00 to 19.50
Buffalo	17.50 to 18.00
Chicago	17.50 to 18.00

STEEL CAR AXLES

Pittsburgh	$32.00 to 33.00
Eastern Pennsylvania	32.00
Cleveland	34.00 to 35.00
St. Louis	33.00 to 33.50
Buffalo	33.00 to 34.00
Chicago	33.50 to 34.50
New York (dealers)	27.00
Birmingham	28.00 to 29.00
Boston (dealers)	26.00 to 27.00

SHAFTING

Eastern Pennsylvania	$26.00 to 28.00
St. Louis	30.50 to 31.00
New York (dealers)	24.00 to 25.00
Chicago	30.00 to 30.50

Iron Foundry Scrap

Gross Tons Delivered to Consumer

CAR WHEELS

Pittsburgh, iron	$31.00 to 32.00
Pittsburgh, steel	24.50 to 25.00
Chicago, iron	29.50 to 30.00
Eastern Pennsylvania, iron	29.00 to 30.00
Cleveland, iron	26.00 to 27.00
St. Louis, iron	25.50 to 26.00
Buffalo, iron	27.00 to 27.50
Birmingham, iron	26.00 to 27.00
Birmingham, tram car	26.00 to 27.00
Boston	25.00 to 26.00
Cincinnati	21.50 to 22.00

NO. 1 CAST SCRAP

Pittsburgh, cupola	$30.00 to 31.00
Chicago, cupola	34.00 to 34.50
Eastern Pennsylvania, cupola	30.00 to 32.00
Cleveland, cupola	30.00 to 30.50
New York, cupola (dealers)	25.00 to 26.00
Cincinnati, No. 1, cupola	24.50 to 25.00
Birmingham, cupola	26.00 to 27.00
St. Louis, railroad	30.00 to 30.50
St. Louis, agricultural	29.50 to 30.00
Buffalo	27.00 to 27.50
Boston	30.00 to 31.00
Valleys	30.00 to 31.00

HEAVY CAST

New York (dealers)	23.50 to 24.00
Buffalo	21.00 to 22.00
Pittsburgh	27.00 to 28.00
Cleveland	20.00 to 21.00
Boston	23.00 to 24.00

MALLEABLE

Pittsburgh, railroad	$25.00 to 26.00
Pittsburgh, agricultural	22.00 to 23.00
Chicago, railroad	28.00 to 29.00
Chicago, agricultural	28.50 to 29.00
Eastern Pennsylvania, railroad	22.00 to 23.00
Cleveland, railroad	25.50 to 26.00
Cleveland, agricultural	18.50 to 19.00
St. Louis, railroad	24.50 to 25.00
St. Louis, agricultural	23.50 to 24.00
Cincinnati, railroad	17.00 to 17.50
Cincinnati, agricultural	16.50 to 17.00
Boston, railroad	23.00 to 24.00
Buffalo	22.50 to 23.50

Miscellaneous Scrap

Gross Tons Delivered to Consumer

RE-ROLLING RAILS

5 feet and over

Pittsburgh	$30.00 to 31.00
Chicago	31.50 to 32.00
Eastern Pennsylvania	32.00
Cleveland	28.50 to 29.00
St. Louis	31.00 to 32.00
Birmingham	27.00 to 28.00
Boston (dealers)	26.00 to 27.00

LOCOMOTIVE TIRES

Chicago	23.50 to 24.00
St. Louis	22.50 to 23.00

BOILER PUNCHINGS

Chicago	$26.00 to 27.00
Eastern Pennsylvania	25.00 to 26.00

When the Scrap Market Is Dull

While seeking a more favorable market the best form in which to hold your sheet scrap, etc., and the form that always commands the best prices is the dense hydraulically compressed bundle.

Thus less storage space is required—under roof to prevent loss from corrosion; and because of greater car tonnage under minimum car rate, you add from 25% to 50% freight savings to your profits.

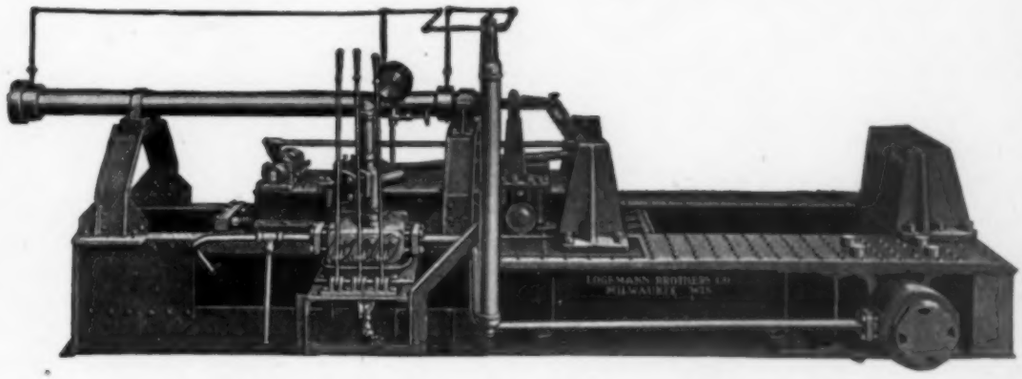
For greatest compression, largest daily output, at lowest operating cost, use

LOGEMANN Double Ram Hydraulic Scrap Metal PRESSES

You can enjoy the advantage of the accumulated experience from hundreds of Logemann scrap bundling presses now in use.

They embody a simplified mechanism that requires no special skill to operate rapidly. Press and pump are so designed that all the motive power applied is utilized, thus reducing power cost.

Powerfully built, all working parts constructed to resist the severest strains—selected material, first class workmanship—all minimize upkeep cost and insure lasting efficiency.



A medium sized press is shown; there are smaller and larger sizes in standard models.

Advise character and daily tonnage of your scrap and let us suggest press best suited to your requirements.

Logemann Brothers Co.

3126 Burleigh Street
Milwaukee, Wis.

Builders of Baling Presses and Hydraulic Machinery

New Trade Publications

SAND-BLASTING.—The W. W. Sly Mfg. Co., Cleveland, has published the November issue of its pamphlet, and in it a description of a "baby" sandblast barrel is given.

DRILL STEEL.—The Ingersoll-Rand Co., New York, is distributing a 28-page booklet in which steel for rock drilling purposes is described and illustrated. Specifications, etc., of steel for various drilling purposes are given.

METAL HOSE.—The United Metal Hose Co., Inc., New York, is circulating a 4-page cardboard circular in which two kinds of flexible metal hose are described and illustrated. Specifications, etc., are given.

STOPEHAMMERS.—A drill for stoping, raising and other work in which holes are above the horizontal is described and illustrated in a booklet recently published by the Ingersoll-Rand Co., New York. This drill is all steel and is furnished with three styles of air feeds and supplied in light and heavy patterns.

DRILL.—A powerful drill designed for shaft sinking and capable of drilling holes of comparatively large diameter to a depth of 12 feet, is described and illustrated in a booklet recently published by the Ingersoll-Rand Co., New York. The drill is of all steel construction.

TOOLS.—Catalog No. 17 has been issued by the Clark Equipment Co., Buchanon, Mich., in which twist drills, reamers, countersinks, flue cutters, lathe tools and chucks are described and illustrated. Specifications are given as well as other data including, drill feeds and speeds, decimal equivalents, tap sizes, etc.

GAS MEASUREMENT.—Pamphlet P, an 8-page leaflet in which Pitot tubes and orifices for measuring the flow of gases in connection with flow meters, are described and illustrated, is being circulated by the Bacharach Industrial Instrument Co., Pittsburgh. The leaflet contains a number of line drawings of these instruments, and the data given shows how they are employed in measuring the flow of gas.

ROLLING MILL MACHINERY.—The Youngstown Foundry & Machine Co., Youngstown, O., has published a booklet in which rolling mill and steel works machinery is described and illustrated. The equipment described includes roll lathes, lever shears, vertical shears, automatic spike machines, boat spike machines, charging box cars, ingot cars, straightening machines, sand-chilled and semisteel rolls.

HEAT INSULATIONS.—The Franklin Mfg. Co., Franklin, Pa., is circulating a large booklet in which pipe coverings such as magnesia, asbestos, etc., are described. The first part of the booklet is devoted to a description of the company's products. The second part consists of sales data and a third section serves as a reference department and contains much valuable information to purchasers of this material. The booklet contains a number of illustrations.

PRESSURE INDICATOR.—A 4-page leaflet has been published by the Bacharach Industrial Instrument Co., Pittsburgh, in which a pressure volume indicator for the control of air delivery to cupolas, is described and illustrated. The instruments consist of a pitot tube installed in the blast pipe and connected to the indicator, which is an inclined tube gage, inclosed so as to be dust proof. The scale is graduted so as to read in cubic feet of air delivered per minute.

AIR COMPRESSORS.—A 10-page booklet is being distributed by the Ingersoll-Rand Co., New York, in which air compressors for belt drive, are described and illustrated. The type described is of the vertical, single stage, single acting, self-oiling, enclosed, center crank design, and is equipped with a heavy main frame, which encloses the main bearings, crankshaft and connecting rod. The air compressing cylinder is on the top of the main frame, to which it is secured by suitable stud bolts. Full details are given.

HOT-BLAST HEATER.—Robert Gordon, Inc., Chicago, has published an 8-page booklet in which a mechanical hot-blast heater is described and illustrated. This heater is designed for use in heating, large or small buildings, foundries of all sizes, factories, garages, temporary buildings, schools, etc., and can be used for drying clay products, asbestos, magnesia, textiles and other products dried by warm air up to a temperature of 400 degrees Fahr. Specifications are given as well as a description of the construction.

FOUNDRY SUPPLIES.—A cloth-bound catalog has been published by Frederic B. Stevens, Detroit, in which complete foundry supplies are listed, described and illustrated. The book not only is a catalog but serves as a reference book, containing valuable information relating to foundry materials, electroplating supplies, firebrick and their respectives uses. The foundry supplies described are: Oils, sand, etc.; cupola furnace; pressure gages; blast volume meter; blowers; elevators; general foundry tools; sand mixers; molding machines, etc. Complete data pertaining to each article or material are given and all equipment is illustrated.

OIL ENGINES.—J. Samuel White & Co., Ltd., East Cowes, Isle of Wight, is circulating an illustrated booklet in which heavy oil engines are described and illustrated. These engines are manufactured by the company in two types and range in power from 150 boiler horsepower to 2000 boiler horsepower. The heavy slow running type is for mercantile marine and land installations. The light type is for special service, including submarines. All marine engines are directing reversible and can be reversed from full ahead to full astern in a few seconds. The starting and reversing gears are simple and readily accessible. The full-speed revolutions can be reduced ⅓ in number for slow running or cruising speeds. Both types work on the 2-cycle principle. The booklet contains a complete description of the engines and besides a number of halftone illustrations, 10 line drawings, showing the various parts of the engines are given.

Opportunities Abroad

Requests for information should be forwarded to district or co-operative office in your district, of the Bureau of Foreign and Domestic Commerce. Each request should be on a separate sheet and be accompanied by the opportunity number

DISTRICT OFFICES

New York, 734 Customhouse; Boston, 1801 Customhouse; Chicago, 504 Federal bldg.; St. Louis, 402 Third Nat'l Bank; New Orleans, Hibernia Bank; Seattle, Henry bldg.; San Francisco, 307 Customhouse

CO-OPERATIVE OFFICES

Cleveland, Chamber of Commerce; Cincinnati, Chamber of Commerce; Los Angeles, Chamber of Commerce; Philadelphia, Chamber of Commerce; Portland, Oreg. Chamber of Commerce; Dayton, Ohio, Chamber of Commerce; Pittsburgh, Chamber of Commerce

A commission agent from Egypt who has been in the United States for several years, is about to return to his native country and desires agencies for the sale of agricultural implements and machinery. Opportunity No. 31353.

An agency is desired by a party in Spain for the sale of mechanical toys, electrical goods and dental supplies. Correspondence should be in Spanish or French. Opportunity No. 31358.

An American Firm of purchasing agents for a manufacturing company in Brazil desires catalogs and quotations in duplicate for the purchase of machinery for the production of bottles, window glass, insulators, etc. Opportunity No. 31364.

A company in Greece desires to purchase and secure an agency for the sale of machinery for building purposes, such as cranes, wagons, aerial wagons for transporting coal, etc., and other machinery. Iron and steel mchinery used in building, railway rails, motor trucks, etc. Opportunity No. 31378.

An Austrian railway company desires to purchase monthly about 30 tons of copper needed in locomotive production, especially such copper as is used in making bars, plates and tubes. Offers should be accompanied with an anlays's of the copper. Opportunity No. 31380.

A company in Denmark desires an agency for the sale of pig iron metals, especially steel, tool steel, machine tools, mining machinery, etc. Opportunity No. 31385.

A commercial agent in France desires to secure an agency on a commission basis for the sale of electrical apparatus, such as wire, insulators, switches, lamps, reflectors, etc. Opportunity No. 31386.

The purchase of 7-foot radial drilling machines for drilling rivet holes in boiler plates, is desired by a firm in England. Opportunity No. 31387.

A firm in England having a branch office in this country, desires to be placed in touch with manufacturers of electrical labor-saving appliances, with a view to their sale in England. It is particularly interested in washing machines, vacuum cleaners, dish-washing machines, electrical clothes dryers, motor-driven sewing machines and electrical water-heating apparatus. Opportunity No. 31394.

An importer in France desires to secure an agency for the sale of hardware, enameled ware, household appliances, electrical supplies, novelties, etc. Opportunity No. 31395.

A company in Honduras desires to purchase machinery for an ice plant, capable of producing 3500 pounds a day. Quotations wanted on both electric and steam machinery. Complete information should be furnished with first communication. Opportunity No. 31396.

A firm in France desires to purchase annealed mild steel; unleaded, 15 to 100 millimeters; leaded, 20 to 100 millimeters; length from 80 to 100 meters; width from 41 to 22 millimeters. Sixty tons of this steel are desired at once and are to be used in making tubing for electrical fixtures. Opportunity No. 31397.

The purchase is desired by a firm in China of tinplate suitable for making cans, wire nails, iron wood screws, steel butts, padlocks, rotary shears, etc. Opportunity No. 31401.